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CONTENTS

DISEASES CAUSED BY BACTERIA AND FUNGI, 1-8.

Staphylococcal infection in lambs associated with tick-bite, 1; Adaptation of *Staph. aureus* to growth in the presence of antibiotics, 1; Bacteria in the udder, 1; Typing of streptococci of milk, 1; Oxygen-stable haemolysin of group A haemolytic streptococci, 2; *V. foetus* agglutinins in bovine sera, 2; Avirulent anthrax vaccine, 2; An inflammatory factor from crude extracts of lesions of *B. anthracis* and its relationship to glutamyl polypeptide, 2; Physiological changes in animals during infection with *B. anthracis*, 2; Antibacterial effects of calf thymus histone and a quaternary ammonium detergent on *B. anthracis*, 2; *Bacillus piliformis* infection in mice, 3; Tuberculous septicaemia in dogs, 3; Method for isolation of *Mycobact. tuberculosis*, 4; Intravenous infection of the chick embryo with tubercle bacilli, 4; TB. carriers, 4; Control of TB. in cattle, 4; Diagnostic culture of tubercle bacilli. A simplified procedure, 4; Suppurative otitis in pigs, 4; Several cases of glanders, 5; Tularaemia, 5; *S. abortus equi* infection in mares, 5; Paratyphoid and paracolon infections in chickens and turkeys, 5; Joint ill in foals, 6; Animal paratyphoid in Finland, 6; Pullorum disease studies in turkeys. Antibody production, agglutination tests, pen contagion and duration of carrier state, 6; Agglutination test with stomach contents of the foetus as diagnostic method for brucella infection, 7; Immunization against contagious abortion, 7; *Br. suis* in aerated broth culture, 7; Lamb dysentery, 7; Persistence of botulinus toxin in carcass material of tortoises, 7; Necrobacillosis, 7; Actinomyces fusiformis infection necrosis, 8.

DISEASES CAUSED BY PROTOZOAN PARASITES, 8-14.

Experimental infection of horses with *T. evansi*, 8; Experiments with *T. venezuelense* and *T. equinum*, 8; Outbreak of dourine in Slovakia, 8; Meningoencephalomyelitis in mice caused by a neurotropic strain of *T. gambiense*, 9; Two strains of *T. gambiense* causing different experimental diseases, 9; Racial characteristics of strains of *T. gambiense*, 9; A neurotropic strain of *T. gambiense*, 9; Mulberry cells in rats infected with *T. gambiense*, 9; Inoculation of one or several trypanosomes into mice, 9; Protective property or serum in *T. vivax* infection, 10; Insusceptibility of pigeons to *T. cruzi*, 10; A semi-solid medium and a fluid medium for growing *Leishmania* and *T. cruzi*, 10; Growth rates of *L. donovani*, *L. brasiliensis*, *L. tropica*, and *T. cruzi* in culture, 9; *In vitro* effects of immune blood on blood and tissue flagellates, 11; An agglutinin to *T. foetus* in vaginal mucus, 11; *T. foetus* in Holland, 11; Coccidiosis in swine, 12; Stovarsol and coccidiosis in rabbits, 12; Plasmodium infection of fowls, 12; Preservation by freezing of *P. gallinaceum*, 12; *Haemoproteus columbae* in Syria, 12; Canine babesiasis in Madagascar, 12; Inclusions in the mononuclear cells of the blood in cattle with *Th. dispar*, 13; Transmission of *Theileria* infection through the egg of *Hyalomma turkmenience*, 13; Susceptibility of cattle to *Theileria* infection, 13; *L. icterohaemoglobinuriae* in cattle, 13; Blood parasites of cattle *S. theileria* and *Bart. bovis* in Australia, 14.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA, 14-17.

Minimizing the effects of F. & M. disease in cows (serum therapy, etc.), 14; Changes in the central nervous system in F. & M. disease infection in mice, 14; Equine rabies, 14; Attempts to obtain fixed rabies virus from dogs accidentally infected during vaccination and from vaccines, 14; Antibody response to influenza A and swine influenza viruses in the serums of infants, 15; Equine encephalomyelitis virus and normal host cellular constituents, 15; Enzootic broncho-pneumonia in pigs. Swine influenza, 15; Spread and control of Teschen disease in Slovakia, 15; Porcine infectious encephalomyelitis, 15; Newcastle disease, 16; Fowl plague, 16; Vaccination against fowl plague, 16; Immunization against fowl plague with crystal-violet vaccine, 16; Auto immunization of mice against pneumonia virus, 17; Inactivation of mourine poliomyelitis viruses by heat, 17; Mite-borne or scrub typhus in Japan, 17; Excretion of agglutinins in urine or rabbits with typhus rickettsia, 17.

IMMUNITY, 17-19.

Estimation of A and B isoantibodies in human serum, 17; Blood Group A substance from hog stomachs and specific precipitates composed of "A" substance and homologous human antibody, 17; Purified blood Group A substances from hog stomach linings, 17; Preparation of swine erysipelas antiserum, 18.

PARASITES IN RELATION TO DISEASE [ARTHROPODS], 19-21.

Commensalism of biting lice and hippoboscid flies on pigeons, 19; Subcutaneous myiasis produced by the larva of *H. bovis* and *H. lineatum*, 19; Climate and tsetse flies, 19; The climogram in the study of the tsetse fly, Myiasis with furunculosis in birds due to *Phaonia* sp., 19; Biology of *B. microplus*, 19; Gammexane and D.D.T. dips for control of arsenic-resistant blue tick, 20; Insects in the abdominal cavity of pigs, 20; *A. reflexus* in the transmission of paratyphoid in pigeons, 20; Sheep scab in Bulgaria, 20; Psoroptic mange in goats and *Notoëdres* infestation in cats, 21; Incidence of parasites in northern Portugal, 21; Metazoan parasites of dogs, 21; Gammexane and arthropods of veterinary importance, 21.

PARASITES IN RELATION TO DISEASE [HELMINTHS], 22-25.

Cysticercosis in calves, 22; *Parascaris equorum* in the heart of a horse, *A. lumbricoides* in the bile duct of a ram and in the mesentery of a child, 22; Disease of zebu cattle associated with *Bunostomum phlebotomum*, 22; Diagnosis of internal parasites in sheep, 22; Verminous pneumonia in sheep, 23; Nutritional and biochemical effects in sheep of *T. colubriformis*, 23; Effect on wool production of *T. colubriformis*, 23; Survival of nematode parasites of sheep on pasture, 23; *Syngamus* infestation in Zoological Gardens, 24; Oesophagostomiasis in pigs, 24; Complement-fixation reaction for diagnosis of trichiniasis, 24; Specific antigen in the blood of filarial patients, 24; Transplantation of adult filarial worms in rats, 24; Effects of protein-deficient diets on immunity to nematodes, 24; Action of Tanacetum and Artemisia on larvae of nematodes, 25; Hydrogen peroxide in helminth infestations of dogs, 25; *Dioctophyma renale* infestation, 25.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS], 25-27.

Carcinogenic substances from pituitary glands of cattle, **25** ; Histopathology of precancerous lesions of the small intestine, **25** ; Bronchogenic carcinomas in mice, **26** ; Urethane and the latent period of tumours induced with the agent of chicken tumour I, **26** ; Tumours of the alimentary tract induced by carcinogenic hydrocarbons, **26** ; Influence of feeding connective tissue on cancer in the mouse, **26** ; Genetic nature of gastric cancer in mice, **27** ; Pathology of gastric carcinoma in mice, **27** ; Mast-cell neoplasia in mice, **27** ; Does the thymus affect the growth of malignant tumours ?, **27** ; Malignant transformation of gastric ulcers in rabbits, **27**.

DISEASES, GENERAL, 27-28.

Torsion of the abomasum in cattle, **27** ; The thyroid gland and syncope in pigs, **28** ; Organic radioiodo compounds for cancer research, **28**.

NUTRITIONAL AND METABOLIC DISORDERS, 28-32.

Prenatal nutrition and infant development, **28** ; Copper deficiency of cattle, " falling disease ", **29** ; Vitamin A metabolism, **29** ; Concentrations of carotene and of vitamin A in the blood of sheep, **29** ; Locomotor disturbances in fowls with vitamin A deficiency, **29** ; Vitamin C in ruminants, **30** ; Waxy muscle degeneration produced by vitamin C deficiency in calves, **30** ; Biotin deficiency in pigs, **30** ; Nicotinamide deficiency after penicillin, **30** ; " Phalaris staggers " in sheep, **30** ; Fluorine intoxication in sheep and its effect upon the teeth, **30** ; Disease of the nervous system among research workers on swayback, **31** ; Disseminated sclerosis, **31** ; Enzootic paraplegia of lambs, **31**.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY, 32-37.

Synovial membrane and synovial fluid, **32** ; Measurement of lactational performance in rats in studies of lactation, **32** ; Red blood corpuscles, **32** ; Leucaemia with local adenopathy in mares, **33** ; Effect of methylene blue on the central nervous system, **33** ; Spontaneous detachment of the galea capitis, **33** ; Iso-electric point of the mucins of the bovine genital organs, **33** ; Genetics and breeding of fowls, **33** ; Bromine excretion in the cock and hen, and action on the genital glands, **33** ; Anterior pituitary hormone in the serum of pregnant mares, **33** ; Serum gonadotrophin in ponies, **34** ; Stilboestrol vet, **34** ; The spleen as an endocrine gland, **34** ; Tubercle bacillus and endocrine diseases, **34** ; Adrenalin in the sweat of horses, **34** ; Hormones and heat regulation, **35** ; The adreno-corticotrophic hormone and respiratory metabolism of the adrenal cortex, **35** ; The thyroid in pregnancy and parturition, **35** ; Potentiation of the vaginal response to oestrone by the " relaxin " fraction of pregnant rabbit serum, **35** ; Hormone content of hippomanes, **35** ; The vertebral column and spinal musculature of mammals, **35** ; Measuring deviation of the loins under the action of weight, **36** ; Chondrodystrophy in Rhode Island Reds, **36** ; Biochemistry of inflammation, **36**.

POISONS AND POISONING, 37-38.

Experimental fluorosis as it affects bones, **37** ; Industrial fluorosis in cattle, **37** ; Poisoning due to feeding on roots, **37** ; Toxic properties of *Myoporum acuminatum*, **38**.

PHARMACOLOGY AND THERAPEUTICS, 38-44.

The chick embryo in chemotherapeutic research, **38** ; The nature and action of the antibiotics, **38** ; Pigments and antibiotic substances from fungi and bacteria, **38** ; The mechanism of lysis by penicillin, **38** ; Production of actinomycin by different actinomycetes, **39** ; Isolation of antibiotic substances from soil micro-organisms, streptothricin and streptomycin, **39** ; Effects of streptomycin on experimental TB. in g. pigs, **39** ; Effect of streptomycin and other antibiotic substances upon *M. tuberculosis*, **39** ; The action of clitocybin on the tubercle bacillus, **40** ; Sulphasuxidine and succinic acid and the tubercle bacillus, **40** ; The bacteriostatic action of p-amino-salicyclic acid (PAS) upon the tubercle bacillus, **40** ; Bacteriostatic property of culture filtrates of tubercle and other acid fast bacilli, **40** ; Carrier epidemics of sulphonamide-resistant pneumococci, **40** ; Phenothiazine against protozoan infections of turkeys and chickens, **41** ; Treatment of fowl coccidiosis with phenothiazine, **41** ; Treatment of rabbit coccidiosis with phenothiazine, **41** ; Formalin for treatment of equine piroplasmosis, **41** ; Treatment of mange in horses in a gas chamber, **42** ; Chaulmoogra oil in the treatment of demodectic mange of dogs, **42** ; Treatment of serofibrinous pleurisy in horses, **42** ; D.D.T. for the control of poultry ectoparasites, **42** ; Mode of entry of contact insecticides, **42** ; A good insecticide *Matricaria inodora*, **42** ; Action of garlic on screw-flies, **43** ; Lead arsenic relieves scouring in lambs due to tapeworm infestation, **43** ; Brilliant green and gentian violet in the treatment of parasitic gastro-enteritis in sheep, **43** ; Pharmacological investigation of colfin, **43** ; The curability of " dumkoller ", **43** ; Sex hormones in treatment of mammary tumours in the bitch, **43** ; Anti-thyroid activity of ergothioneine, **44** ; Effect of some sulfhydryl-containing substances on the toxicity of an organic mercurial compound, **44**.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION, 44-46.

Milk in North America, **44** ; Efficient milking, **44** ; Toxinfection of meat origin caused by *S. paratyphi C*, **45** ; Obligatory notification of TB., **45** ; Protection of hen eggs against bacterial decomposition, **45** ; Spray-dried egg and food poisoning, **46** ; Veterinary training course in Buenos Aires, **46** ; National parks in the Belgian Congo, **46**.

LIVESTOCK HYGIENE, 46-47.

Double-rowed cow sheds and droplet infection : Sea transport of horses, **47**.

ZOOTECHNY, 47.

Trucking livestock ; Black quarter ; Skin diseases which damage or destroy leather.

TECHNIQUE AND APPARATUS, 48-49.

The culturing of specimens suspected of containing tubercle bacilli, **48** ; Agar-streak method for assaying antibiotic substances, **48** ; Desiccation and lyophilization of biological products, **48** ; Rapid method for diagnosis of canine babesia infection, **48** ; The Piccolyte resins as microscopic mounting media, **49** ; Block-surface staining, **49** ; Incubator fitted with a microscope, **49** ; Copying pencils for numbering pigs, **49** ; Determination of cobalt in biological materials, **49** ; Possibility of transferring directly from alcohol to paraffin, **49**.

MISCELLANEOUS, **50**.
Cannibalism in fowls.

REPORTS, **50-52**.

Nigeria: Agricultural Department for 1944, **50**; Trinidad and Tobago: Survey of animal husbandry, feeding, management and veterinary services in the West Indies, **51**; U.S.A.: Secretary of Agriculture, 1944, **51**; Control of rabies. Report by the committee of the New York Academy of Medicine, **51**; Sweden: Army veterinary service for 1943 and 1944, **52**; U.S.S.R.: Sanitary and animal hygiene. Proceedings of the Veterinary Section of the Academy of Agricultural Sciences 21st to 25th February, 1940, **52**; Report of the bacteriological laboratory of slaughterhouse I, Essen, 1943, **52**.

BOOK REVIEWS, **52-56**.

Bovine tuberculosis [Francis], **52**; Veterinary anaesthesia [Wright], **54**; Diseases of poultry [Blount], **54**; Animal nutrition [Maynard], **55**; An introduction to bacteriological chemistry [Anderson], **55**; Systematic technique of the inspection of butchers' meat [Lafenêtre,] **56**; Histomonocytic reticulosis [Cazal], **56**.

INDEX TO AUTHORS

ANON., 7, 16, 30, 31, 34, 46, 47.

Abraham, E. P., Callow, D., & Gilliver, K., 1.
Adams, J. M. See Rickard, E. R., et al., jt. authors, 15.
Agul'nik, M. A., 41.
Alikaev, V. A. See Pichugin, V. M., et al., jt. authors, 46.
Anderson, C. G., 55.
Araujo, T. L., 21.
—, & Guimarães, L. M., 25.
de Armas, J. See Vogelsang, E. G., jt. author, 8.

Beck, A., 16.
Beck, A. B. See Bennetts, H. W., et al., jt. authors, 29.
Bekker, P. M., & Graf, H., 20.
Beltrán, E., 12.
Bendayan, J. P., 42.
Bendich, A., Kabat, E. A., & Bezer, A. E., 17.
Bendixen, H. C. See Larsen, L. H., jt. author, 14.
Benedek, R., 35.
Bennetts, H. W., Beck, A. B., Harley, R., & Evans, S. T., 29.
—, Harley, R., & Evans, S. T., 29.
Benoit, J. See Lombard, C., jt. author, 33.
Bernard, M. See Poursines, Y., et al., jt. authors, 8.
Bezer, A. E. See Bendich, A., et al., jt. authors, 17.
—. See also Kabat, E. A., jt. author, 17.
—. See also Kabat, E. A., et al., jt. authors, 17.
Bendich, A. See Kabat, E. A., et al., jt. authors, 17.
Bivins, J. A. See Corpron, R., et al., jt. authors, 6.
Bloch, H. S., & Ray, F. E., 28.
Blom, E., 33.
Bloom, W. L., McGhee, W. J., Cromartie, W. J., & Watson, D. W., 2.
—. See also Watson, D. W., et al., jt. authors, 2.
Blount, W. P., 54.
Boddie, G. F., 30.
Bodin, S., 18.
Boero, J. J., & D'Angelo, E., 19.
Bonfante, G., 29.
Borde, R. See Poursines, Y., et al., jt. authors, 8.
Bouvier, G. See Hauduroy, P., et al., jt. authors, 3.
Brashear, A. D. See Hegre, E. S., jt. author, 49.
Brizard, A. See Florio, R., et al., jt. authors, 5.
Brocklehurst, I. W., 2.
Browaeys, J., 9.
Brumpt, E., & van Ty, D., 12.
Brunaud, M., & Pitre, J., 34.
Bryan, W. R., Riley, V. T., & Calnan, D., 26.
Buck & Lamberton, 12.
Bugie, E. See Waksman, S. A., et al., jt. authors, 39.
van den Burg, W. B., 11.
Buzanec, J., 48.

Calisti, V., 33.
Callender, S. T., 32.
Callow, D. See Abraham, E. P., et al., jt. authors, 1.
Calnan, D. See Bryan, W. R., et al., jt. authors, 26.
Calzada, V., & Szyfres, B., 25.
Campbell, A. M. G., Daniel, P., Porter, R. J., Russell, W. R., Smith, H. V., & Innes, J. R. M., 31.
Canham, A. S., 22.
Carlson, F. N. See Habermann, R. T., jt. author, 43.
Carpenter, R. K., Macleaod, L. D., & Reiss, M., 35.
Carruthers, C. See Wicos, L. F., et al., jt. authors, 49.
Carter, H. B., Franklin, M. C., & Gordon, H. McL., 23.
Cassamagnaghi (hijo), A., 19, 24.
del Castillo, E. B., 34.
Caubet, P., 9.
—. See also Stéfanopoulo, G., et al., jt. authors, 9.
Cazal, P., 56.
Chang, S. L., 10.
—, & Negherbon, W. O., 10.
Chu, J. P., 35.
Cooke, A. See Ivy, A. C., jt. author, 27.
Corpron, R., Bivins, J. A., & Stafseth, H. J., 6.
Cory, E. N. See Quigley, G. D., jt. author, 42.
Cowie, A. T., & Folley, S. J., 32.
Cromartie, W. J. See Bloom, W. L., et al., jt. authors, 2.
—. See also Watson, D. W., et al., jt. authors, 2.

D'Angelo, E. See Boero, J. J., jt. author, 19.
Daniel, P. See Campbell, A. M. G., et al., jt. authors, 31.
Davies, D. V., 32.
Day, F. T., & Rowlands, I. W., 34.
Decourt, P., & Schneider, J., 12.
Dedieu, P. See Lafenêtre, H., jt. author, 56.
Deringer, M. K., & Dunn, T. B., 27.
Deschiens, R., 25.
—, Jouan, C., & Lamy, L., 49.
Dewar, A. D., Hall, K., & Newton, W. H., 35.
Dias, E., 10.
Dias, S. See Tropa, E., jt. author, 21.
Doll, E. R., & Hull, F. E., 23.
Donaldson, A. W., & Otto, G. F., 24.
Dukalov, I. A., 13.
Dunn, T. B. See Deringer, M. K., jt. author, 27.
Duvolon, S. See Roubaud, E., et al., jt. authors, 9.
—. See also Stéfanopoulo, G., et al., jt. authors, 9.

Ellinger, P., & Shattock, F. M., 30.
Ellis, G. H., & Thompson, J. F., 49.
Engel, L. L., & Randall, R., 15.
Ernst, A. M., 43.
Etévé, J. See Stéfanopoulo, G., jt. author, 9.
Evans, S. T. See Bennetts, H. W., et al., jt. authors, 29, *bis*.
Eveleth, D. F. See Goldsby, A. I., jt. author, 22.

Fan, P. C., 33.
Farah, A. See Long, W. K., jt. author, 44.
Feldman, W. H., & Hinshaw, H. C., 39.
Florio, R., Brizard, A., & Ladrat, J., 5.
Folley, S. J. See Cowie, A. T., jt. author, 32.
Foot, A. S., 44.
Fourie, J. M., 7.
Francis, J., 38, 52.
Franks, M. B., 24.
Franklin, M. C., Gordon, H. McL., & Macgregor, C. H., 23.
—. See also Carter, H. B., et al., jt. authors, 23.
Frieden, E. H., 38.

Gaase, A., 24.
Gard, S., 3.
Gaschen, H., 19, *bis*.
Gaud, J. See Joyeux, C., jt. author, 23.
Geiger, W. B. See Waksman, S. A., et al., jt. authors, 39.
Gerhardt, P., 7.
Germany. Rep. Bact. Lab., Essen, 1943, 52.
Gerundo, M., 40.
Gilliver, K. See Abraham, E. P., et al., jt. authors, 1.
Gióvine, N., Rangel, N., Machado, A. V., Lamounier, R. D., & Wilwerth, A., 7.
Gisske, W., 45.
Glässer, 15.
Glaessner, K., 26.
Goldsby, A. I., & Eveleth, D. F., 22.
—. See also Franklin, M. C., et al., jt. authors, 23.
Gordon, H. McL. See Carter, H. B., et al., jt. authors, 23.
Graf, H. See Bekker, P. M., jt. author, 20.
Graf, L. H. See Weissman, N., jt. author, 2.
Grau, H., 28.
Green, H. H., 37.
Gross, W. O., 17.
Grosso, A. M., Prieto, C., & Strobino, L. E., 23.
Guimarães, L. M. See Araujo, T. L., jt. author, 25.

Habermann, R. T., & Carlson, F. N., 43.
Hall, K. See Dewar, A. D., et al., jt. authors, 35.
Harley, R. See Bennetts, H. W., et al., jt. author, 29, *bis*.
Hathaway, C. R., 19.
Hauduroy, P., Bouvier, G., & Rosset, W., 3.
Hays, F. A., 36.
Heckly, R. J. See Watson, D. W., et al., jt. authors, 2.
Hegre, E. S., & Brashear, A. D., 49.
Herbert, D., & Todd, E. W., 2.
Hickin, N. E., 42.
Hinshaw, H. C. See Feldman, W. H., jt. author, 39.
Hoffman, H. A., Jones, E. E., & Stover, D. E., 5.
Hollande, A. C., 39.
Holz, K., 14.
Horning, E. S., 26.
Huggett, A. St. G., 28.
Hull, F. E. See Doll, E. R., jt. author, 23.

Innes, J. R. M. See Campbell, A. M. G., et al., jt. authors, 31.
Ivy, A. C., & Cooke, A., 27.

Janz, G. J. See Ribeiro, J. M., jt. author, 29.
Jerlov, S., 45.
Jones, E. E. See Hoffman, H. A., et al., jt. authors, 5.
Jope, E. M., 32.

Jouan, C. See Deschiens, R., et al., jt. authors, 49.
Jovanovits, J., 37.
Joyeux, C., & Gaud, J., 23.
Julianelle, L. A. See Siegel, M., et al., jt. authors, 40.

Kabat, E. A., Bendich, A., & Bezer, A. E., 17.
—, & Bezer, A. E., 17.
—. See also Bendich, A., et al., jt. author, 17.
Karr, H. V. See Siegel, M., et al., jt. authors, 40.
Khatenever, L. M., 5.
Kieliger, F., 34.
König. See Leuenberger, M., jt. author, 41.
Kornienko, Z. P., & Shmyreva, M. K., 13.
Kraus, L., 4.
Krüger, F., 49.

Ladrat, J. See Florio, R., et al., jt. authors, 5.
Lafenêtre, H., & Dedieu, P., 56.
Lamberton. See Buco, jt. author, 12.
Lamounier, R. D. See Gióvine, N., et al., jt. authors, 7.
Lamy, L. See Deschiens, R., et al., jt. authors, 49.
Larsen, L. H., & Bendixen, H. C., 14.
Lawson, A., & Rimington, C., 44.
Lawson, R. B., & Melnick, J. L., 17.
Lee, H. F., & Stavitsky, A. B., 4.
Lehmann, J., 40.
Leitão, J. S., & Lina de Sousa, J. M., 20.
de León, J. P., & Peluffo, C. A., 5.
Leuenberger, M., & König, 41.
Levaditi, C., & Vaisman, A., 38.
Lewis, R. A. See Senekjie, H. A., jt. author, 11.
Lina de Sousa, J. M. See Leitão, J. S., jt. author, 20.
Lindtner, M., 33.
Loje, K., 27.
Lombard, C., & Benoit, J., 33.
Long, W. K., & Farah, A., 44.
Lorenz, E., & Stewart, H. L., 26.
—. See also Stewart, H. L., jt. author, 25.
Loutit, J. F., 32.

Maas, 16.
McDiarmid, A., 1.
McDonald, I. W., 30.
de Macedo, L. R. T., 41.
McGhee, W. J. See Bloom, W. L., et al., jt. authors, 2.
—. See also Watson, D. W., et al., jt. authors, 2.
Macgregor, C. H. See Franklin, M. C., et al., jt. authors, 23.
Machado, A. V. See Gióvine, N., et al., jt. authors, 7.
Macleaod, L. D. See Carpenter, R. K., et al., jt. authors, 35.
McPeak, E., & Warren, S., 27.
Marambio, J. A., 21.
Marty, J., 12.
Maynard, L. A., 55.
Meira, M. P. See Rathsan, E. W., jt. author, 42.
Mejlbo, E., 8.
Melnick, J. L. See Lawson, R. B., jt. author, 17.
Menkin, V., 36.
Meyer, J. R., 43.
Milk in N. America. Rep. Milk Mission, 1945, 44.
Miller, W. C., 51.
Moller, S., 37.
Morén, A., 52.
Mulhearn, C. R., 13.

Näätänen, E., 33.
Negherbon, W. O. See Chang, S. L., jt. author, 10.
Newton, W. H. See Dewar, A. D., et al., jt. authors, 35.
Nigeria. Ann. Rep. Agric. Dept., 1944, 50.
Niznánsky, F., 8.
Nörr, J., 43.
Nordlund, I., 50.
Novicky, R., 12.

Ojemann, J. G., 43.
Olicchio, D. See Savarino, S., jt. author, 40.
Otto, G. F. See Donaldson, A. W., jt. author, 24.
van Oye, E. See Rodhain, J., jt. author, 20.

Peirce, A. W., 29.
Peluffo, C. A. See de León, J. P., jt. author, 5.
Perroni, P., 3.
Philip, C. R., 17.
Pichugin, V. M., Alikaev, V. A., & Troyanovskiĭ, D. P., 46.
Pierce, A. E., 11.
Pigoury, L., 12.
—. See also Poursines, Y., jt. author, 8.
—. See also Poursines, Y., et al., jt. authors, 8.
Pinto, C., & Vaz, Z., 22.
Pires, A., 46.
Pitre, J. See Brunaud, M., jt. author, 34.
Porter, R. J. See Campbell, A. M. G., et al., jt. authors, 31.
Potts, W. H., & Vanderplank, F. L., 42.
Poursines, Y., & Pigoury, L., 8.
—, —, Borde, R., & Bernard, M., 8.
Preobrazhenskiĭ, P. P., 36.
Prieto, C. See Grosso, A. M., et al., jt. authors, 23.
Provost, A. See Roubaud, E., jt. author, 10.

Quigley, G. D., & Cory, E. N., 42.

Rabies control. Rep. N.Y. Acad. Med., 51.
Randall, R. See Engel, L. L., jt. author, 15.
Rangel, N. See Gióvine, N., et al., jt. authors, 7.
Raschke, O., 49.
Rathsan, E. W., & Meira, M. P., 42.
Ray, F. E. See Bloch, H. S., jt. author, 28.
Reilly, H. C. See Waksman, S. A., jt. author, 48.
Reĭngardt, L. V., & Zabud'ko-Reĭngardt, T. N., 42.
Reiss, M. See Carpenter, R. K., et al., jt. authors, 35.
Reynolds, D. M. See Waksman, S. A., et al., jt. authors, 39.
Ribeiro, J. M., & Janz, G. J., 29.
Richey, M. G. See Wicks, L. F., et al., jt. authors, 49.
Rickard, E. R., Thigpen, M. P., & Adams, J. M., 15.
Rieckhof, W., 27.
Riedmüller, L., 15.
Riek, R. F., & Wright, S. E., 38.
Riley, V. T. See Bryan, W. R., et al., jt. authors, 26.
Rimington, C. See Lawson, A., jt. authors, 44.
Rislakki, V., 6.
Robinson, E. M., 47.
Rodhain, J., & van Oye, E., 20.
Rosset, W. See Hauduroy, P., et al., jt. authors, 3.
Rossi, P., 45.
Roubaud, E., 9.
—, & Provost, A., 10.
—, Stéfanopoulo, G. J., & Duvolon, S., 9.
Rowlands, I. W. See Day, F. T., jt. author, 34.
Russeff, C., 20.
Russell, W. R. See Campbell, A. M. G., et al., jt. authors, 31.

Sachweh, P., 33.
Salomon, Lé. See Salomon, Lo., jt. author, 43.
Salomon, Lo., & Salomon, Lé, 43.
Sannié, C., 38.
Savarino, S., & Oricchio, D., 40.
Saxinger, G., 6.
Schaeffer, G., & Thibault, O., 34.
Schatz, A., & Waksman, S. A., 39.
—. See also Waksman, S. A., et al., jt. authors, 39.
Schmid, G., 41.
Schneider, J. See Decourt, P., jt. author, 12.
Schulte, 52.
Scott, L. P., 47.
Seigel, M., Karr, H. V., & Julianelle, L. A., 40.
Senekjie, H. A., & Lewis, R. A., 11.
Sengir, E., 47.
Shattock, F. M. See Ellinger, P., jt. author, 30.
Shattock, P. M. F., 1.
Shmyreva, M. K. See Kornienko, Z. P., jt. author, 13.
Slabospitskiĭ, T. P., 7.
Slijper, E. J., 35.
Smith, H. V. See Campbell, A. M. G., et al., jt. authors, 31.
Spears, H. N., 16.
Spisni, D., 30.
Sprent, J. F. A., 22.
Stafseth, H. J. See Corpron, R., et al., jt. authors, 6.
Stavitsky, A. B. See Lee, H. F., jt. author, 4.
Stéfanopoulo, G., Caubet, P., & Duvolon, S., 9.
—, & Etévé, J., 9.
—. See also Roubaud, E., et al., jt. authors, 9.
Stegena, T., 4.
Sterk, V., 7.
Sterne, M., 2.
Steward, J. S., 21.
Stewart, H. L., & Lorenz, E., 25.
—. See also Lorenz, E., jt. author, 26.
Stover, D. E. See Hoffman, H. A., et al., jt. authors, 5.
Strobino, L. E. See Grosso, A. M., et al., jt. authors, 23.
Strong, L. C., 27.
Stura, C. A., 48.
Sureau, B., 17.
Sweden. Rep. Army Vet. Serv., 1943, 1944, 52.
Szyfres, B. See Calzada, V., jt. author, 25.

Tabusso, M. E., 31.
Thibault, O. See Schaeffer, G., jt. author, 34.
Thigpen, M. P. See Rickard, E. R., et al., jt. authors, 15.
Thompson, J. F. See Ellis, G. H., jt. author, 49.
Todd, E. W. See Herbert, D., jt. author, 2.
Toop, C. R., 4.
Trinidad & Tabago. Survey of anim. husb., feeding, mgmt. & vet. serv., 51.
Tropa, E., & Dias, S., 21.
—, & Calente, S., 14.
Troyanovskiĭ, D. P. See Pichugin, V. M., et al., jt. authors, 46.
Tselischev, A. A., 13.
van Ty, D. See Brumpt, E., jt. author, 12.

Ulibarri, F. F., 19.
U.S.S.R. Proc. Vet. Sect. Acad. Agric. Sci., 1940, 52.
U.S.A. Rep. Comm. Amer. Trudeau Soc., 48.
—. Rep. Sec. Agric., 1944, 51.

Vaills, L., 14.
Vaisman, A. See Levaditi, C., jt. author, 38.
Valente, S. See Tropa, E., jt. author, 14.
Vanderplank, F. L. See Potts, W. H., jt. author, 42.
Vaz, Z. See Pinto, C., jt. author, 22.
Vittone, R., 30.
Vogelsang, E. G., & de Armas, J., 8.
Van Vranken, M., 4.

Wachtel, H. K., 25.
Waksman, S. A., Bugie, E., & Schatz, A., 39.
—, Geiger, W. B., & Reynolds, D. M., 39.
—, & Reilly, H. C., 48.
—. See also Schatz, A., jt. author, 39.
Ward, A. R., 1.
Warren, S. See McPeak, E., jt. author, 27.
Watson, D. W., Cromartie, W. J., Bloom, W. L., Heckly, R. J., McGhee, W. J., & Weissman, N., 2.
—. See also Bloom, W. L., et al., jt. authors, 2.
Weissman, N., & Graf, L. H., 2.
—. See also Watson, D. W., et al., jt. authors, 2.
Wharton, D. R. A., 24.
Wicks, L. F., Carruthers, C., & Richey, M. G., 49.
Wilwerth, A. See Gióvine, N., et al., jt. authors, 7.
Witte, J., 42.
Wright, J. G., 54.
Wright, S. E. See Riek, R. F., jt. author, 38

Zabud'ko-Reĭngardt, T. N. See Reĭngardt, L. V., jt. author, 42.
Zubaj, J., 15.

Errata *V.B.* **17.** 511, abst. 2172, *for* " KENYA (1946) **Annual report of the Veterinary Department. 1945** ".
read " KENYA (1946) **Annual report of the Veterinary Department, 1944** ".
V.B. **17.** 499, abst. 2122, *for* " chloral hydrate " *read* " chloralose ".

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DISEASES CAUSED BY BACTERIA AND FUNGI

McDIARMID, A. (1946.) **Studies on enzootic staphylococcal infection in lambs associated with tick-bite. II.—The bacteriology of the disease.**—*Vet. Rec.* **58.** 43–244. [For part I, see *V. B.* **16.** 63.] 1

M. examined 19 strains of staphylococci isolated from cases of tick pyæmia. Four of these strains were coagulase negative, produced no toxin, were not pathogenic to mice and produced very pale pigment. The remaining 15 strains were coagulase positive, were pathogenic to mice and produced orange pigment; 13 of them produced $\alpha\beta$ toxin and two produced β toxin only. The fermentation reactions are given of all the strains on 15 carbohydrates. With one exception, cross agglutination was demonstrated with all the pathogenic strains, agglutination in highest dilution being obtained with homologous sera.

The view is expressed that strains deficient in one or both toxins were not another species of staphylococcus but represented strains of *Staph. aureus* that had lost some of their virulent characters as a result of subcultivation.—ANGUS FOGGIE.

ABRAHAM, E. P., CALLOW, D., & GILLIVER, K. (1946.) **Adaptation of *Staphylococcus aureus* to growth in the presence of certain antibiotics.**—*Nature, Lond.* **158.** 818–821. 2

Resistant strains could be produced by growing a type culture of *Staph. aureus* in the presence of each of 3 antibiotics. A strain resistant to one antibiotic was neither more nor less resistant to the others than was the original culture. By selecting a strain, resistant to one of the antibiotics, and growing it in the presence of the others in succession, a strain resistant to all three antibiotics was produced.

From a study of the rate at which these adaptations occurred, the authors conclude that the production of resistant strains is not merely a natural selection from the parent culture but that in the presence of antibiotics an alteration of the staphylococcal cells occurs.—ANGUS FOGGIE.

WARD, A. R. (1944.) **Bacteria in udder is normal condition.**—*Bull. Dairy Res. Bur.* **23.** 149–152. 3

The author supports his view that true mastitis is a clinical entity not to be confused with the mere isolation of streptococci from the milk of an apparently normal udder. It is postulated that appropriate cultural methods will detect streptococci and other organisms. He considers, therefore, that these organisms may form the normal flora of the udder.

He claims that if thorough clinical examinations of herds are made, the testing of milk samples is not necessary, but may be desirable. Good results may follow the isolation of cases, the avoidance of injury of the udder and the use of hygienic methods of milking.—J. KEPPIE.

SHATTOCK, P. M. F. (1944.) **The serological typing and grouping of some streptococci of milk and milk products.**—*Proc. Soc. agric. Bact.*, 1944. pp. 69–71. 4

The author refers particularly to the following streptococci which are of interest to the dairy bacteriologist. In Lancefield's Group D there is a similarity in biochemical and cultural reactions between *Str. faecalis*, *Str. zymogenes*, and *Str. iquefaciens*. *Str. durans* has many of the characteristics of *Str. faecalis*, but is haemolytic, fails to ferment mannitol or sucrose, and possesses only weak reducing properties. It occurs in spray-dried milk powders and pasteurized milk in America, but does not occur with any frequency in Gt. Britain. *Str. bovis* from cow dung has not been definitely grouped. Many strains react with Group D sera, but a proportion give negative or equivocal results.

Str. uberis, which is responsible for sporadic cases of bovine mastitis, has been placed in Group E, but of 16 strains examined by the author none reacted with a Group E serum. The few strains of *Str. infrequens* examined serologically precipitated a Group E serum.

In Group N many workers regard *Str. lactis* as a variant of *Str. faecalis*, but the author has

differentiated them on serological grounds. *Str. lactis* and *Str. cremoris* possess a common group antigen which differentiates them from Groups A-M.

Str. thermophilus is of frequent occurrence in dairy products and the author considers it may constitute a new group.—J. O. L. KING.

HERBERT, D., & TODD, E. W. (1944.) **The oxygen-stable haemolysin of group A haemolytic streptococci (streptolysin S).**—*Brit. J. exp. Path.* **25.** 242–254. [Authors' summary copied *verbatim.*] **5**

Certain strains of Group A streptococci are described which produce only streptolysin S; other strains produce only streptolysin O. The majority of Group A strains produce both haemolysins. Haemolysis by surface colonies on blood-agar plates is entirely due to streptolysin S, and strains which only produce streptolysin O appear "non-haemolytic" by this test. Deep colonies may show haemolysis due to streptolysin O under certain conditions. Some chemical properties of streptolysin S and its partial purification are described. It is concluded that streptolysin S and streptolysin O are two entirely distinct haemolysins, both chemically and serologically.

BROCKLEHURST, I. W. (1946.) **Vibrio foetus agglutinins in bovine sera.**—*Vet. J.* **102.** 279–282. **6**

B. records an examination of blood samples received for routine diagnosis against a *V. foetus* antigen. The paucity of details submitted with the samples was a disadvantage in assessing the results. The macroscopic test was used for estimating agglutination the suspension being formolized in the orthodox manner.

B.'s observations were :– (1) that 7% of sera reacted positively to *V. foetus*, a titre of 1 : 320 being taken as positive, (2) that in one herd of 15 animals where *V. foetus* was known to exist, 14 had a titre between 20 and 80 [the question of specific and non-specific agglutinins is very important], (3) that 17 bulls had an interesting range of titres, 12 of them between 20 and 160, suggesting exposure to infection with *V. foetus*, (4) that the titres of all animals were probably due to contact with *V. foetus*, (5) that the prozone phenomenon was present in some of the tested sera, (6) and that there was no cross agglutination between *Br. abortus* and *V. foetus*.—W. R. KERR.

STERNE, M. (1946.) **Avirulent anthrax vaccine.**—*Onderstepoort J. vet. Sci.* **21.** 41–43. **7**

Thirty million doses of the spore vaccine prepared from the avirulent uncapsulated strain of *B. anthracis* have been used in S. Africa during the last few years with good results. The vaccine is easily prepared and can be used for all domestic animals, g. pigs being suitable for testing. General details of the preparation of the vaccine are given. Cattle react mildly to the vaccine and develop a good immunity within a few days. Horses react more vigorously and a month to six weeks is required for sound immunity to develop. Sheep react mildly and goats generally have no reaction, but occasionally large swellings may appear and deaths have been reported.—R. SCARISBRICK.

WATSON, D. W., CROMARTIE, W. J., BLOOM, W. L., HECKLY, R. J., MCGHEE, W. J., & WEISSMAN, N. (1947.) **Studies on infection with *Bacillus anthracis*. V. The isolation of an inflammatory factor from crude extracts of lesions of *B. anthracis* infection and its biological and chemical relationship to glutamyl polypeptide.**—*J. infect. Dis.* **80.** 121–136. [For previous parts, see *V. B.* **17.** 455.] **8**

BLOOM, W. L., MCGHEE, W. J., CROMARTIE, W. J., & WATSON, D. W. (1947.) **Studies on infection with *Bacillus anthracis*. VI. Physiological changes in experimental animals during the course of infection with *B. anthracis*.**—*Ibid.* 137–144. **9**

WEISSMAN, N., & GRAF, L. H. (1947.) **Studies on infection with *Bacillus anthracis*. VII. A comparison of the antibacterial effects of calf thymus histone and a quarternary ammonium cationic detergent on *B. anthracis*.**—*Ibid.* 145–153. **10**

V. A comparison is made between the inflammatory factor contained in crude extracts of anthrax lesions and glutamyl polypeptide, a substance extractable from the capsulated organisms, *B. anthracis*, *B. mesentericus* and *B. subtilis*. Chemical, electrophoretic and spectrophotometric analysis revealed that the substances, though closely related, are not identical.

Biologically the inflammatory factor possesses the ability to damage tissue in a manner similar to that of living *B. anthracis*, whilst glutamyl polypeptide produces no observable lesions. The inflammatory factor injected intracutaneously into rabbits with a small lethal dose of *B. anthracis* spores allowed the animals to resist infection, as a result, it is suggested, of the rapid dispersion of the spores by the tissue damaging action. The inflammatory factor is also capable of interfering with blood clotting, a property not shown by glutamyl polypeptide. Both the inflammatory factor and glutamyl polypeptide can completely inhibit the anthracidal substance isolated from leucocytes and other cells. These observations suggest that the capsule produced by *B. anthracis in vivo* may possess different properties from the capsule produced in simple media.

VI. This paper presents the significant findings of an attempt to determine what host

systems are disturbed during an infection with *B. anthracis*. In the rabbits under experiment the progressive enlargement of the local lesion and the terminal episode were the only indication of disease observable on inspection. The terminal phase was characterized by drowsiness, muscular weakness and excessive response to stimuli. Blood culture may be positive as early as eight hours after intracutaneous injection; in 50% it was positive in 24 hours. Even in immune animals bacteraemia occurred. In non-immune animals there was a rapid fall in the number of mature polymorphonuclear leucocytes.

No changes could be detected in the protein or non-protein nitrogen of the serum, but 14 out of 21 animals had definite hyperglycaemia. The intravenous injection of calcium salts, starting from the time of infection, led to a definite prolongation of survival and eight out of 20 animals recovered, the local lesions in calcium treated animals being small and firm, instead of diffuse and oedematous. Magnesium and sodium salts had no effect.

It is concluded from these experiments that the cause of death is not loss of blood serum from the vascular system, but that there is a disturbance in carbohydrate metabolism which can be partly overcome by the injection of calcium salts; a similarity thus exists to magnesium poisoning, which the terminal episode resembles.

VII. As a result of studying the anthracidal activity of extracts of animal tissues it was thought that a basic protein might be concerned. It was therefore decided to study the anthracidal activity of calf thymus histone and to compare this with that of the quarternary ammonium detergent, zephiran. Parallel experiments were carried out with lecithin to determine whether anthracidal power was related to an effect on the cell surface or on an internal system. A study was also made on the virulence-promoting power of the gastric mucin of pigs. The experiments were carried out on anthrax bacilli *in vitro* in a Warburg apparatus, judging effects by the oxygen uptake.

In studying the virulence-promoting factor in pig gastric mucin a nucleic acid fraction was isolated and it was found that desoxyribonucleic acid was inhibitory; the action of this substance was therefore tested against histone.

Zephiran was found to inhibit oxygen uptake, lecithin being able completely to neutralize this action. Calf thymus histone could stop oxygen uptake, desoxyribonucleic acid neutralizing this action. Lecithin caused delay in histone action, but could not completely neutralize it, whilst desoxyribonucleic acid had no action on zephiran activity. The difference in the behaviour of lecithin is ascribed to a difference in the stability of the salts formed. The mechanism of histone action is discussed and attention is drawn to the probable importance of the lysine content of antimicrobial factors, it being pointed out that the lysine content of one anthracidal unit of histone and one anthracidal unit of inflammatory factor were equal within the limits of error of the methods used.—U. F. RICHARDSON.

GARD, S. (1944.) **Bacillus piliformis infection in mice, and its prevention.**—*Acta path. microbiol. scand.* Suppl. No. 54. pp. 123–134. [In English.] **11**

A disease which killed more than 1,200 mice in a month is described. In young animals it pursues a rapid course with apathy, loss of appetite, diarrhoea, loss of weight, and finally death in 2–3 days, with practically no lesions *post mortem*. At 5–6 weeks of age, the main symptom was diarrhoea, the disease was more protracted and mortality lower. Oedema and infiltration of the submucous tissue in the region of the ileo-colic valve were frequent. Adult mice attacked were usually found dead without previous symptoms. The only P.M. lesion discovered was the presence of a large number of small necrotic foci of embolic origin in an enlarged liver. From these foci an organism was isolated, resembling that described by Tyzzer as *Bacillus piliformis*, which resisted all attempts at cultivation.

The disease is controlled by changing the diet from wet to dry food, "On the basis of this observation the condition is supposed to have been a dyspepsia of a toxic nature, caused by a bacterial decomposition of the food, during which multiplication and invasion of *B. piliformis* was favoured."
—R. SCARISBRICK.

*PERRONI, P. (1942.) Sobre la tuberculosis en los carníroros domésticos. Un caso de septicemia tuberculosa en un perro. [**TB. in domestic carnivores. Tuberculous septicaemia in a dog.**]—*Res. Bol. Soc. brasil. Med. Vet.* **1.** No. 912. 42. Abst. from abst. in *Gac. vet., B. Aires.* **5.** 191. (1943.) **12**

In a review of the literature P. found records of 1853 cases of TB. in dogs. None of these cases recorded the finding of tubercle bacilli in the blood stream.

P. states that from an acute case in a dog tubercle bacilli were cultivated from the blood and a g. pig inoculated with heart blood from the dog died after 40 days. The lesions in the liver and kidneys were of the miliary type and the pleura was thickened. The organism was of the human type.

HAUDUROY, P., BOUVIER, G., & ROSSET, W. (1945.) Nouvelle technique de découverte des bacilles tuberculeux dans des produits patho-

logiques. [**A new method for isolation of** *Mycobacterium tuberculosis.*]—*C. R. Soc. Biol. Paris.* **139.** 354–355. **13**

Results are recorded indicating that the treatment of suspect tuberculous material with 15% sulphuric acid prior to g. pig inoculation kills acid-alcohol fast organisms in a proportion of specimens. On the other hand g. pig inoculation with non-treated pathological material results in death from septicaemia in 20% of cases. It is suggested that the injection of sulphonamide preparations in conjunction with the inoculation of non-treated suspect tuberculous material produces optimum results and reduces deaths from septicaemic causes to 6%.—J. Lochiel McGirr.

Lee, H. F., & Stavitsky, A. B. (1947.) **Intravenous infection of the chick embryo with tubercle bacilli.**—*Amer. Rev. Tuberc.* **55.** 262–280. [Spanish summary. English summary copied *verbatim.*] **14**

Intravenous inoculation of chick embryos with a human strain of tubercle bacilli (A–27) results in the prompt establishment of infection within the parenchymatous organs. The histological picture produced has been presented. With proper dosage of bacilli the uniformity of distribution of lesions within the liver makes possible quantitative evaluation of the degree of infection in any given group of embryos. This method may serve as a screening procedure in chemotherapeutic research. The validity of the method was sustained in trials with streptomycin which was found to prevent the development of histological evidence of infection. Despite the absence of visible bacilli or histological response in streptomycin-treated embryos, viable bacilli were recovered from the organs in large numbers by cultural methods.

Stegena, T. (1946.) Eenige bijzonderheden over open lijders. [**TB. carriers.**]—*Tijdschr. Diergeneesk.* **71.** 506–509. [Abst. from English and French summaries.] **15**

Observation on "open" TB. cases in herds, and comparison with cases in the same herds not classed as "open", indicated that the older animals tended to fall within the former class. S. therefore emphasizes that, as a measure of control within the herd, when reactors are slaughtered it should be the older animals that are first so dealt with.

Kraus, L. (1946.) Tlumení tuberkulosy a kontrola zdraví skotu v politickém okrese Uh. Hradiště. [**Control of TB. and other diseases in cattle in the Uh. Hradista district.**]—*Čas. československ. Vet.* **1.** 142–148. **16**

During the years 1942–43, 27,041 cattle and 3,134 goats in 73 villages were tested by the intradermal tuberculin test. 1,515 cattle (5·67%) and 61 goats (1·84%) reacted. In 46 villages 5% reacted; in nine, 5–7·5%; in 13, 7·6–10%; in three, 10·1–15% and in two, over 15%. 2·4% of 4,713 calves, 1·33% of 1,072 bulls from 6 months to 2 years old, 4·6% of 312 bullocks, 13·41% of 6,329 heifers from 6 months to 2 years old and 8·03% of 14,660 cows reacted. 28·9% of the cows aged from 2–5 years reacted; 42·1% aged from 5–10 years and 5·67% aged over 10 years.

The intradermal tuberculin test has proved valuable in the detection of infected animals. In eradication work the farmer must play his part; calves and young stock must be shielded from infection. Veterinary specialists should be trained for the control and eradication of TB.—E. Přibyl.

Van Vranken, M. (1947.) **Diagnostic culture of tubercle bacilli. A simplified procedure in public health work.**—*Amer. Rev. Tuberc.* **55.** 374–378. [Spanish summary. Author's summary and conclusions slightly amended.] **17**

As a result of a test with routine specimens, it was found that the oxalic acid egg-yolk method devised by Corper and his colleagues for the diagnostic culture of tubercle bacilli from human pathological specimens (including sputum, urine, gastric washings, purulent fluids, etc.) is superior to the treatment with the oxalic acid reagent and culture on Petragnani's malachite green multiple mixture medium used in many health and sanatorium laboratories.

Trisodium phosphate ($Na_3PO_4.12H_2O$), used in equal volume of 23 per cent. solution for twenty-four hours at 37° C., by Corper and Stoner, has been found to be a superior reagent for destroying contaminating microörganisms in pathological specimens for the cultural diagnosis of tuberculosis. Combining the phosphate treatment with the egg-yolk medium (Corper) provides a simple diagnostic procedure to isolate human and bovine tubercle bacilli from routine specimens. It is recommended on the basis of extensive routine tests in public health work reported on here.

Toop, C. R. (1946.) **Suppurative otitis in pigs.**—*J. Agric. W. Aust.* **23.** 136–138. **18**

Suppurative otitis occurs mainly in young pigs up to four months of age and is usually secondary to infection of the respiratory tract. *Corynebact. pyogenes* is the causal agent and reaches the middle ear *via* the Eustachian tube. Characteristic symptoms of abnormal head carriage, walking in circles, misdirection and ataxia, are observed. Usually only one ear is affected. Associated with these symptoms are those of toxemia, that is, emaciation and poor growth. On P.M. examination there is an accumulation of

thick cheesy pus in the middle ear cavity. No satisfactory treatment is available and preventive measures are those directed against the respiratory tract infections with which this disease is commonly associated. The author gives no indication of the local incidence or importance of this condition and no new work is presented.

—D. C. Blood.

Florio, R., Brizard, A., & Ladrat, J. (1942.) Réflexions sur quelques cas de morve. **[Several cases of glanders.]**—*Rev. Méd. vét., Lyon et Toulouse.* **93.** 168–179. **19**

The authors' observations were made in March 1939, on seven horses with glanders examined and slaughtered at the Toulouse Veterinary School. (The animals belonged to the cavalry of the Republican armies expelled from Spain). Publication was deferred owing to the 1939–40 war and their subsequent captivity.

All the animals reacted to the intradermal mallein test. Six of them had clinical symptoms of glanders, the 7th had a latent infection. All were chronic cases; typical lesions were present.

—F. E. W.

—. (1943.) Tulyaremiĭmaya infektsiya. **[Tularaemia.]** [Edited by Khatenever, L. M.] pp. 216. Moscow: Narkomzdrav. Medgiz. [Abst. amended from review in *Bull. Hyg., Lond.* **21.** 278. Signed: D. J. Bauer.] **20**

Nine authors have collaborated to produce an exhaustive and well-documented monograph on tularaemia, which covers all aspects of the subject in considerable detail. While due notice is accorded to the work of American and other authors, the main object is to present work carried out in Russia during the last 15 years, with a detailed exposition of the features of the disease as it is encountered in the Soviet Union.

In a chapter on epidemiology, a classification of the various types of outbreak which occur in Russia is proposed, including insect-transmitted and food- and water-borne types (the latter due to contamination by infected mice), and outbreaks seen in the agricultural population, arising from contact with infected rodents, especially water rats. The epidemiology of the disease is given next, with an account of the 42 animals known to be susceptible to the disease in nature; the chapter is summarized by a useful table listing these animals by natural orders and families, together with the time and place of outbreaks attributed to them.

The chapter which follows is mainly of zoological interest, containing descriptions of susceptible rodents, with some notes on their life-history and epidemiological significance; methods of estimating numbers of rodents in field studies are also dealt with. All insects which are known to be vectors of the disease in natural or laboratory conditions are described, and a good pictorial synoptic chart is given which illustrates all possible methods of transfer of the disease from animals to man.

Chapters are devoted to the morphology and cultural characteristics of *Br. tularensis*, and to laboratory methods of diagnosis, including skin testing with tularin and agglutination reactions. A slide agglutination test is described, which can be carried out with a drop of serum dried on paper, or with a drop of blood which is haemolysed by the antigen, allowing agglutination to be observed. This method has been of use in field studies of epizootics.

As may be expected in a work to which several authors have contributed, not all chapters are of equal merit, but taken as a whole the monograph will be of value to those interested in tularaemia, since, apart from bringing together in compact form an account of work carried out in all countries in which the disease is prevalent, it fully summarizes Russian work published in journals which have not been generally available.

de León, J. P., & Peluffo, C. A. (1946.) El aborto en la yegua "pur—sang". Primera constatacion de salmonella abortus equi en el Uruguay. [*Salmonella abortus-equi* **infection in mares in Uruguay.**]—*Bol. mens. Direcc. Ganad., Montevideo.* **29.** 546–549. **21**

After moving a bunch of 50 mares to another farm eight abortions occurred in a month. There were no premonitory symptoms and the health of the mares was not affected except for slight loss of appetite, and a vaginal discharge which yielded to irrigation with potassium permanganate within 48 hours.

Positive agglutination tests were given to *S. abortus equi* at titres varying from 1 : 50 to 1 : 1,500, and pure cultures of the organism were isolated from an aborted foetus. A vaccine prepared from strain EE.UU. supplied by Edwards lead to immediate cessation of abortions, and a satisfactory holding to services of mares which had previously aborted.—U. F. Richardson.

Hoffman, H. A., Jones, E. E., & Stover, D. E. (1943.) **Paratyphoid and Paracolon Infections in Chickens and Turkeys.**—*Bull. Calif. Dep. Agric.* **32.** 66–72. **22**

Twenty species of paratyphoid and paracolon organisms (*viz.*, *Salmonella* species other than *S. pullorum* and *S. gallinarum*) have been found in chickens and turkeys in California.

The similar symptoms and lesions produced by the two groups of organisms are described. Swelling and inflammation of the caeca are found

commonly. The liver may have yellowish grey spots on the surface. Mortality from paratyphoid in turkeys may be anything up to 90%. In chicks the paratyphoid mortality has so far been low. Paracolon infection may cause severe mortality especially in poults. 92·1% of paratyphoid and 85·7% of paracolon infection in turkeys occurred in birds under 5 weeks old. 97·7% of paratyphoid in chickens occurred in birds under 5 weeks. With one exception all the paracolon cases were in chicks under 3 weeks.

Methods of spread and the difficulties of control are discussed.—D. LUKE.

SAXINGER, G. (1942.) Methodik und Impfstoffwahl bei Fohlenlähmeschutzimpfungen. [**Joint ill in foals.**]—*Tierärztl. Rdsch.* **48.** 378–381. **23**

In this article S. replies to criticisms of his recommendations for the prevention of joint-ill published in 1941. He advocated a combination of hygienic measures and vaccination of both the pregnant mares and the new-born foals with a polyvalent serum and vaccine, "hipposan", said to protect against streptococci, *Bact. viscosum equi*, *Bact. coli* and paratyphoid organisms. Pregnant mares received two injections of vaccine during the latter half of pregnancy, reinforced in some cases by a dose of hyperimmune serum. Foals from mares which had not been vaccinated were given serum and vaccine immediately after birth and all foals received doses of vaccine alone when eight and 14 days old, to prevent delayed joint-ill. Other measures recommended were attention to navel hygiene and provision for the pregnant mares of a diet which had a suitable Ca : P ratio and adequate vitamin D.

The main criticism directed against these recommendations was the use of polyvalent immunizing agents instead of relying on specific sera and vaccines prepared to protect against streptococci and *Bact. viscosum equi*. Certain other criticisms were also made against the methods recommended by S. These criticisms are answered in detail and S. sees no reason to depart from his original suggestions, which he states have given excellent results in practice: a detailed account of the results obtained is promised. He maintains that the value of polyvalent immunizing agents has been conclusively demonstrated, particularly by Ramon and his colleagues, and he also states that infection of foals with salmonella has become common during recent years and that infection with *Bact. coli* is not uncommon: the use of serum and vaccine against all four organisms is thus essential.—E. G. WHITE.

RISLAKKI, V. (1946.) Om de hos djur förekommande paratyfus-(salmonella-) infektionerna i Finland. [**Animal paratyphoid in Finland.**]—*Skand. VetTidskr.* **36.** 193–212. [English summary.] **24**

In the years 1925–44 salmonella infection has been diagnosed at the Sut veterinary laboratory in 1,050 animals of which 621 were poultry infected with *S. pullorum*. The remaining cases were in cattle, 62; horses, 123; swine, 11; foxes, 206; dogs, 3; lions, 1; pigeons, 22 and black grouse, 1. In most cases salmonella organisms were isolated and 78 of the strains have been typed and the results are shown in tabular form. The species isolated were *S. dublin*, *S. danysz*, *S. typhimurium*, *S. cholerae-suis* and *S. abortus*. The infections in cattle were all septicaemia cases in calves. *S. abortus* is stated to have been introduced into Finland in 1942 during the war and to have spread rapidly.—M. C.

CORPRON, R., BIVINS, J. A., & STAFSETH, H. J. (1947.) **Pullorum disease studies in turkeys. I. Antibody production following intravenous and oral infection, relative value of tube and whole-blood plate agglutination tests, pen contagion and duration of carrier state.**—*Poult. Sci.* **26.** 340–351. **25**

Twenty mature turkey hens from pullorum-free stock were divided into three groups.

Seven birds were injected intravenously with 1–2 ml. of saline suspension of an 18-hour culture of *S. pullorum*. Seven birds received 3–5 ml. of the suspension orally. Six birds were left as controls. All the birds were confined in the same pen. The birds were tested at intervals after infection by both the tube test and the rapid test. The tube test detected agglutinins three days after intravenous injection of the organisms and the whole-blood rapid test detected agglutinins five days after injection. Maximum titres occurred about the ninth day in both the orally infected and the intravenously infected groups after which the titre gradually dropped. The majority of the intravenously infected group still had titres of 1/200 at 221 days. Three orally infected birds had become non-reactors to both the tube and rapid tests after 221 days.

The tube test was found to be more sensitive; it gave positive reactions earlier. The rapid test was about half as effective as was the tube test in detecting birds of low titre, or in the early or late stages of of infection.

During the eight months' test period zones of inhibition were observed in some sera and the data suggests that some samples giving a weak reaction at 1/25 may be positive if tested at 1/100.

The control birds remained negative to the whole-blood test for 191 days. From the 17th to 38th days intermittently weak positive results

of the tube tests were seen among the controls at 1/25 and 1/50 dilutions.—D. Luke.

Slabospitskiĭ, T. P. (1943.) Reaktsiya agglutinatsii s soderzhimym zheludka abortirovannovo ploda—bspomogatel'nyĭ metod uskorennoĭ diagnostiki brutsellëza. [**Agglutination test with stomach contents of the foetus as an additional rapid diagnostic method for brucelle infection.**]—*Veterinariya, Moscow.* No. 10–11. pp. 15–16. **26**

For a rapid diagnostic test the contents of the stomach of the aborted foetus were used with a brucella culture as an antigen, to give an agglutination reaction.

The stomach contents are placed in a vessel and after settling the transparent fluid is drawn off and diluted with physiological saline to give dilutions of 1 in 5 and 1 in 10. The stomach fluid: antigen mixture is examined microscopically (50–80 diameters).

The author states that the agglutination titre of the stomach contents of the foetus is related to that of the titre in the blood of the mother.

The results obtained by this test agree with those obtained by the usual methods. The author only regards this test as a useful auxiliary to the others.—S. W. Salter.

—. (1944.) Neue Bestimmungen über die Impfung gegen das seuchenhafte Verkalben. [**Immunization against bovine contagious abortion.**]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* August 4th. 259. **27**

Since 1942 experiences with the inoculation of living *Br. abortus* led to new regulations for control of the disease in Germany.

The fully virulent vaccine must only be prepared from strain " Langenhagen XI " or another strain determined by the minister for Home Affairs. Opportunity for immunization of less heavily infected herds—in which the use of fully virulent cultures is prohibited is given by the issue of the attenuated Strain X. This strain may be used without special permission, and must only be used for heifers up to one year of age. The inoculation has to be performed twice at four weekly intervals with 5 ml. of the vaccine. The time for use of this vaccine expires three weeks after its production.

Cows showing signs of imminent abortion or premature birth, have to be isolated. Only after termination of the lochial discharge and thorough disinfection of the hind quarters and feet, can the cows be brought back to the herd. No cow is served before three months post partum. In such cases a community bull is only allowed to be used if he is specially reserved for abortus-infected animals. These precautions may be abandoned one year after the last immunization.

Cattle—including calves—are allowed to be sold only if a blood test, within three weeks of sale, has been negative. They may, however, be sent for slaughtering or to abortus-infected herds without restriction.

Having been proved to be innocuous and satisfactory the avirulent bile culture vaccine of the " Behring " company is permitted for use under following conditions: non-pregnant heifers and cows may be inoculated with this product; animals to be inoculated for the first time must be inoculated at least 14 days before service. The precautions are the same as above.—P. Sasse.

Gerhardt, P. (1946.) *Brucella suis* **in aerated broth culture. III. Continuous culture studies.**—*J. Bact.* **52.** 283–292. [For part II, see *V. B.* **17.** Absts. 2473, 2474.] **28**

An apparatus was devised in which continuous aerated cultures of *Br. suis* were produced by simultaneous and continuous addition of fresh medium and withdrawal of the product. Little manual attention was required and a culture of high cell concentration and purity was produced. The production time of about 48 hours under customary methods was reduced to approximately eight hours. The apparatus could be operated safely and without contamination for prolonged periods of time.—S. J. Gilbert.

Šterk, V. (1940.) Griža janjadi. [**Lamb dysentery.**]—*Vet. Arhiv.* **10.** 340–346. [Abst. from French summary.] **29**

Lamb dysentery occurs in Jugoslavia and *Clostridium welchii* has been isolated from affected lambs. The article consists of a discussion of the literature and a brief account of the work done to confirm the diagnosis.

Fourie, J. M. (1946.) **Persistence of botulinus toxin in carcase material with special references to that of tortoises.**—*J. S. Afr. vet. med. Ass.* **17.** 85–87. **30**

Botulinus toxin can persist in carcasses for long periods: for example, toxicity was apparent in the carcass of a hare after 54 days, in an iguana after 90 days. If the material is protected from the disintegrating action of climatic factors as leaching by rain, toxicity may be retained for much longer periods. Tortoises are protected by the shell and their tissues may be toxic after a year. They are therefore regarded as a real source of danger and 80% of cases of lamsiekte occurring on the Kaap Plateau in Bechuanaland seem to be traceable to this cause.—R. Scarisbrick.

Gióvine, N., Rangel, N., Machado, A. V., Lamounier, R. D., & Wilwerth, A. (1945.) Necrobacilosis. [**Necrobacillosis.**]—*Gac. vet. B. Aires.* **7.** 282–305 & 337–348. [Trans-

lation appeared in **Arcg. Esc. sup. vet., Minas Gerais.* **1.** (1943).] **31**

The authors review necrobacillosis with special reference to its occurrence in Brazil.

They describe in Minas Gerais necrotic gingivitis, necrotic glossitis, necrotic osteomyelitis of the jaw, gangrenous dermatitis, foot rot, necrotic rhinitis, necrotic hepatitis, generalized necrobacillosis and the experimental disease. Conventional control and therapeutic measures are discussed.—H. G. A.

MEJLBO, E. (1940.) Om Nekrobacillosen og dens specifikke Terapi med Bidrag til Nekrosebakteriens Biologi. [**Actinomyces Fusiformis infection necrosis. Biology of necrosis bacilli.**] —*Maanedsskr. Dyrlaeger.* **52.** 297–310 & 321–345. **32**

M. carried out numerous experiments of which the following were the results. Mouse-lethal toxin was produced by a few days culture on brain medium. This toxin did not by itself cause necrosis. An apparently different type of toxin was produced by culture in Martin's broth: it was more lethal to mice and caused acute pulmonary oedema and cachexia without necrosis.

Specific endotoxin caused sterile necrosis and was demonstrated by injecting mice with an extract of formol-heated dried bacteria. It proved impossible to prepare a specific antitoxin by the usual methods, against this endotoxin and little success followed the use of formolized culture used with the aim of conferring immunity, though it appeared to inhibit the necrotising power to some extent.

Trials of a formol vaccine in bovines gave results which suggested that it may prove to be of value, but more experience is required before a definite opinion can be expressed.—J. E.

See also absts. **81** (swine erysipelas); **90** (salmonellosis transmitted by argas ticks); **155** (TB. and endocrine diseases); **171-180** (action of antibiotics on various organisms); **181** (culture filtrates of TB.); **204** (meat poisoning and salmonellosis); **205** (TB. and meat inspection); **206** (bacterial decomposition of eggs); **213** (blackleg); **215** (culture of tubercle bacilli); **216** (assay of antibiotics); **217** (lyophilization); **219-221** (technique); **226** (contagious bovine pleuro-pneumonia); **234** (bovine tuberculosis, including a contrast with human tuberculosis); **238** (an introduction to bacteriological chemistry).

DISEASES CAUSED BY PROTOZOAN PARASITES

POURSINES, Y., PIGOURY, L., BORDE, R., & BERNARD, M. (1943.) Trypanosomose expérimentale du cheval à *Trypanosoma evansi* (souche syrienne). I. Etude clinique. [**Experimental infection of horses with the Syrian strain of *Trypanosoma evansi*. I. Clinical study.**]—*Bull. Soc. Path. exot.* **36.** 235–244. **33**

POURSINES, Y., & PIGOURY, L. (1943.) II. Etudes sérologique et hématologique. [**II. Serological and haematological studies.**]—*Ibid.* 244–256. **34**

I. Four stallions were inoculated with the Syrian strain of *T. evansi*, and observations made daily until death. The experimental evidence is tabulated giving the clinical picture, the temperature curve, and the parasitic blood picture (obtained from an examination of peripheral blood slides) also the relationship between the temperature variations and the occurrence of parasites. The disease is characterized by intermittent febrile phases, by anaemia and progressive wasting, accompanied by oedema and albuminuria. Death occurs as a rule in three to four months. The temperature curve is undulatory. Parasites appear in the circulation five to nine days after inoculation. There is a general correlation between the index of parasites in the blood and the temperature curve. The appearance of large numbers of parasites in the circulation may occur at varying intervals after the febrile phases.

II. Serological and haematological observations on horses are described following artificially produced infection with *T. evansi*. Fulton's reaction (serum precipitation against mercuric chloride) although not a specific test may be of assistance in diagnosis when the parasites are not apparent in blood smears. A positive reaction is obtained at the end of the second week, after infection. After about three months there is precipitation in about five hours at a titre of one in 100,000. The formol reaction has little practical application owing to its irregular and late appearance. It is not really definite until the third month. A complement fixation test is positive after three or four weeks but is given by trypanosomes of all species.—S. BRIAN KENDALL.

VOGELSANG, E. G., & DE ARMAS, J. (1946.) Observaciones con el Tripanosoma Venezuelense, Mesnil 1910. [**Experiments with *Trypanosoma venezuelense* and *T. equinum*.**]—*Rev. Med. vet. Parasit., Caracas.* **5.** 39–43. **35**

A brief review is given of local work on the epidemiology of *T. venezuelense* and *T. equinum*, which some authorities consider to be varieties of a single species. Inoculation of cattle with blood from horses infected with *T. venezuelense* gave very similar infections to those previously recorded for *T. equinum* by ROVEDA [see *V. B.* **15.** 42] and suggested that cattle may also be the reservoir host of *T. venezuelense*.—U. F. RICHARDSON.

NIŽNÁNSKY, F. (1946.) Príspevok k žrebčej nákaze na Slovensku. [**Outbreak of dourine in Slovakia.**]—*Čas. československ. Vet.* **1.** 283–286. **36**

First case of dourine in Slovakia was ascer-

tained in September, 1945, in a mare. Although clinical symptoms were specific, complement fixation test was negative and the mare died showing symptoms of paralysis. The disease was introduced into Slovakia at the end of the war by infected army horses. Due to uncontrolled services dourine spread rapidly, by February, 1946, it was diagnosed in eight districts. All cases were identified in the chronic stage. The parasite was observed microscopically only in one horse.

For the control and the eradication of the disease the following measures were ordered in February, 1946 :–

1. Stallions over one year should be castrated except those which are elected for breeding purposes.

2. State and private stallions may be used for service only when blood serum examination was negative.

3. Mares are admitted to the stallion when by veterinary examination were found free of infection.

4. All state and private stallions are examined monthly.

5. Mares showing symptoms of dourine are to be brand marked with ŽN and their use for breeding is forbidden.—E. Přibyl.

I. Stéfanopoulo, G., & Étévé, J. (1943.) Méningo-encéphalo-myélite de la souris blanche due à une souche " neurotrope " de *Tr. Gambiense*. [**Meningo-encephalomyelitis in white mice caused by a " neurotropic " strain of** *Trypanosoma gambiense*.]—*Bull. Soc. Path. exot.* **36.** 43–45. [Discussion pp. 45–46.] **37**

II. Caubet, P. (1944.) Différences morphologiques chez deux souches de *Trypanosoma gambiense* déterminant des maladies expérimentales différentes. [**Differences in the morphology of two strains of** *Trypanosoma gambiense* **causing different experimental diseases.**]—*Ibid.* **37.** 285–290. **38**

III. Roubaud, E. (1944.) A propos des caractéristiques raciales des souches de *Trypanosoma gambiense*. [**The racial characteristics of strains of** *Trypanosoma gambiense*.]—*Ibid.* **37.** 290–291. **39**

IV. Roubaud, E., Stéfanopoulo, G. J., & Duvolon, S. (1944.) Étude chez le rat blanc d'une souche neurotrope de *Trypanosoma gambiense*. [**A neurotropic strain of** *Trypanosoma gambiense*.]—*Ibid.* **37.** 292–296. **40**

V. Stéfanopoulo, G., Caubet, P., & Duvolon, S. (1944.) Présence de cellules muriformes de mott chez les rats infectés de *Trypanosoma gambiense*. [**Mulberry cells in rats infected with** *Trypanosoma gambiense*.]—*Ibid.*, **37.** 296–302. **41**

This series of articles deals with observations on a strain of *T. gambiense* isolated from the Cameroons which had shown itself to be neurotropic in mice, and had retained that peculiarity over six years of maintenance in the laboratory in mice and other experimental animals.

1. Records that infections in mice were slow and irregular, and characterized by paralysis which might occur without the appearance of other symptoms. On death trypanosomes might only be detectable in the brain. On autopsy there was enlargement of lymphatic nodes, but the spleen and liver showed little alteration. Hyperaemia, was present in the brain, which also showed perivascular infiltration with lymphocytes and plasmocytes, and in addition a meningitis. Acidophile inclusions and morular cells of Mott were not detected.

II. A comparison between this neurotropic strain of *T. gambiense* and an ordinary septicaemic strain showed that the organisms were longer, the greater length being attributable to an increase in the flagellum, and the absence of forms without a free flagellum. The septicaemic strain had a greater percentage of dividing forms, and it is suggested that more rapid multiplication might prevent the formation of the longer forms.

III. Suggests that strains of *T. gambiense* may vary in their affinity to blood, lymphatic tissue and nervous tissue. When human cases with nervous symptoms became more prominent at Tabora there was a decrease in the number of cases. This observation may be explained by the relatively rare occurrence of neurotropic trypanosomes in the blood, and their inaccessibility to tsetse fly.

IV. On the transference of the neurotropic strain to rats, there were marked nervous symptoms and loss of weight; the infection caused little temperature variance. The pathology was characterized by meningo-encephalomyelitis with perivascular infiltration. Neurons were frequently attached and neuronophagia might be apparent. Morular cells of Mott occurred in the brain and spleen.

V. Details are given of the detection of Mott's cells and the methods used. It was pointed out that these cells are not peculiar to trypanosomiasis, but are believed to be plasmocytes which have undergone fuchsinophile degeneration, they are more numerous in trypanosomiasis than in other conditions. References are given to their detection in other animals, and these include rats with *T. lewisi* infection and cattle.

—U. F. Richardson.

Browaeys, J. (1943.) Inoculation d'un ou de plusieurs trypanosomes à la souris. [**The inoculation of one or several trypanosomes into the mouse.**]—*Bull. Soc. Path. exot.* **36.** 147–150. **42**

Improvement in technique has made it possible to isolate a single trypanosome and hence an accurate dosage can now be given to experimental animals.

Mice were injected subcutaneously with a strain of *T. brucei* which normally killed in about nine days. The period of incubation in general decreased as the number of parasites injected was increased. The duration of the disease did not appear to be related to the number of parasites injected. More than two trypanosomes appear to be needed to ensure infection. The route of inoculation may influence the probability of infection.—S. Brian Kendall.

Roubaud, E., & Provost, A. (1941.) Propriété protectrice non spécifique du sérum dans les infections à *Tr. cazalboui* (souche des Antilles). **[Non-specific protective property of serum in *Trypanosoma vivax* (Antilles strain) infection.]** —*Bull. Soc. Path. exot.* **34.** 124–126. **43**

On incubating citrated blood containing *T. brucei* with sera from goats infected with *T. vivax* and from a normal goat, it was found that after 24 hours the specimen containing the normal serum was still infective to mice, whilst that containing the serum from a *T. vivax* case was non-infective. With shorter periods of incubation the sera from *T. vivax* cases caused a lengthening of the incubation period in comparison to that of the normal serum. It appears that protection was only given by these heterologous antisera when the trypanosomes under experiment were exposed to them in the incubator to the limit of their normal vitality.—U. F. Richardson.

Dias, E. (1944.) Não receptividade do pombo doméstico à infecção por *Schizotrypanum.* **[Insusceptibility of the domestic pigeon to *Trypanosoma cruzi.*]**—*Mem. Inst. Osw. Cruz.* **40.** 191–193. **44**

Two pigeons were inoculated with blood from a g. pig, showing a heavy infection of a strain of *Trypanosoma cruzi* from a human patient. Results were negative to microscopic examination. *Triatoma infestans* and *Rhodnius prolixus* were fed on the pigeons with results which were also negative. —U. F. Richardson.

I. Chang, S. L. (1947.) **Studies on haemoflagellates. I. A semi-solid medium and a fluid medium with a solid base for growing *Leishmania* and *Trypanosoma cruzi*.**—*J. infect. Dis.* **80.** 164–171. **45**

II. Chang, S. L., & Negherbon, W. O. (1947.) **Studies on haemoflagellates. II. A study of the growth rates of *Leishmania donovani, L. brasiliensis, L. tropica*, and *Trypanosoma cruzi* in culture.**—*Ibid.* **80.** 172–184. **46**

I. A semi-solid and a liquid medium are described in which it is claimed earlier, and much more profuse, growths of various strains of *leishmania* and *T. cruzi* can be obtained than in any of the media described previously. For the semi-solid medium the basic ingredients consist of bacto-tryptose 15 g., liver extract powder 10 g., glucose 2 g., NaCl 4 g., KCl 0·4 g., Na_3PO_4 5 g., bacto-agar 2 g., and distilled water 1,000 ml. This is sterilized in the autoclave, cooled, and 150 ml. horse serum and 20 ml. horse haemoglobin solution added, mixed and dispensed into flasks or tubes. The organisms grow in the upper layers of the medium, so the depth is immaterial.

The fluid medium has the same basic ingredients except that the 2 g. agar is omitted. The basic solution is divided into two parts of 600 ml. and 400 ml. and 7·2 g. agar is added to the former. This part is boiled and dispensed hot in 20–25 ml. lots into Erlenmeyer flasks, then autoclaved and allowed to cool in an upright position to allow the agar base to form a good flat surface. To the 400 ml. portion is added 60 ml. horse serum and 8 ml. solution of horse haemoglobin, and this mixture is dispensed in amounts of 15 ml. over the solid base. The organisms grow on the surface of the solid base. The organisms grow most luxuriantly at pH7, but the pH drops to 6 when the growth peak is reached in about a week and the medium becomes unfavourable. With these media the basic part has a pH7·6–7·8 which drops to 7·4 after the addition of the serum.

Abundant growths of *L. tropica, L. donovani, L. braziliensis* and *T. cruzi* were obtained in both these media, the peak being reached in the fluid medium in a week and in the semi-solid medium in two weeks. Cultures do not survive so long as in N.N.N. medium. Inoculated with *L. donovani* material from hamsters growth appeared in the semi-solid medium in about a week, and in the liquid medium 2–4 days later.

The semi-solid medium is recommended for diagnostic purposes, the liquid medium being valuable for work in which agar particles must be avoided.

II. In observing the rate of growth in liquid medium, cultures showed the same division into a lag phase, phase of logarithmic growth, phase of stationary growth and phase of declining growth as bacteria, except that the lag phase was only observed in *L. donovani.* The logarithmic phase lasted two days for *L. tropica* and up to six days for *T. cruzi.* Each species of organism differed in the length of the logarithmic phase of multiplication and also in its rate of growth, *L. donovani* being much the slowest. In cultures of *T. cruzi* in which trypanosome and crithidial forms appeared, a secondary rise followed the first growth

curves, and the cultures might remain vigorous and thriving for weeks.

An increase in the temperature of incubation favoured *L. tropica* within the range 17°C. to 27°C., and *L. braziliensis* and *T. cruzi* within the range 17°C. to 32°C. *L. donovani* growth showed a negative correlation with increase of temperature. Growth was poor at body temperature, *L. donovani* tolerating this temperature least.—U. F. R.

SENEKJIE, H. A., & LEWIS, R. A. (1945.) ***In vitro* effects of specific immune blood on certain blood and tissue flagellates.**—*Proc. Soc. exp. Biol., N.Y.* **59.** 185–188. [Authors' summary slightly amended.] **47**

The blood of rabbits immunized with various blood and tissue flagellates has been found to exert an inhibitory or lethal action on cultures of the homologous organisms. This effect was very marked on cultures of *Trypanosoma cruzi* and *Leishmania donovani*, but was slight on those of *L. brasiliensis* and *L. tropica*. These factors are associated with the blood serum, are thermostable at 56°C., but are partially destroyed at 70°C.

The inhibitory or lethal action is observed *in vitro* in a medium prepared with the immune whole blood or immune serum on which the homologous organisms are grown. The reaction takes place in three stages, first, the organisms lose their motility and become agglutinated. These round up becoming markedly swollen, and finally, the internal structure undergoes hyalinization resulting in the death of the protozoon.

Complement is not necessary for this reaction. This inhibitory or lethal factor appears to differ from ablastin.

PIERCE, A. E. (1946.) **Demonstration of an agglutinin to *Trichomonas foetus* in vaginal mucus. [Correspondence.]**—*Nature, Lond.* **158.** 343. **48**

P. records his finding of the presence of antibodies to *T. foetus* in the vaginal mucin. He records also that the disappearance of the organism from the vaginal discharge coincides with the appearance of trichomonad antibodies. Further he observes that the antibodies are confined to the vaginal mucin and not to the watery uterine type of discharge.

In addition P. showed that by using his method, agglutinins to *Br. abortus* could be detected in the vaginal mucus.—W. R. KERR.

VAN DEN BURG, W. B. (1938.) Trichomonas foetus Riedmüller in Nederland. **[*Trichomonas foetus* Riedmüller in Holland.]**—*Thesis, Utrecht.* pp. 131. **49**

The author refers to the discovery of *T. foetus* in the Netherlands, describing the parasite, records its geographical distribution in Europe and elsewhere and his investigations to ascertain its prevalence in the country. The mode of spread, pathogenicity and symptoms in bulls and cows, the course of an outbreak in a herd, the diagnosis, treatment of bulls and breeding females by various chemicals, the economic importance of the infection, its control and eradication in herds and state control by legislation are all discussed in detail.

Although the presence of a flagellate, detected in the semen of bulls in January, 1934, was suspected by him to be the cause of an increasing number of cases of sterility in his practice, it was not until April, 1936, that the presence of *T. foetus* was recorded from cows in the Netherlands. As soon as DE BLIECK & BOS [see *V. B.* **8.** 422] drew the attention of the veterinary profession to the presence of this flagellate, the author undertook an investigation of bulls used by owners who reported that their cows failed to "hold to the bull", concluding that the disease had been present since at least 1933. By means of a map compiled from records obtained from practitioners by means of a questionnaire, he illustrates the distribution of the disease and shows that it is most prevalent in the south-east corner of the country, where it occurs in the whole of the province of Limburg, as well as in North Brabant and East Gelderland.

By questioning breeders and dairy farmers concerning the difficulties experienced in getting cows "to hold" and butchers about cases of pyometra, the author gained the impression that the disease invaded the country about 1930. ABELEIN had concluded that the adjoining districts in Germany were invaded in 1929.

The mode of spread seems to be essentially by the bull at service. The pathogenicity and symptoms depend on the susceptibility of the stock and the vitality of the organism, as well as predisposing factors such as catarrhal conditions of the genitalia caused by other infections. As an outbreak progresses chronic cases become more prevalent. There are indications that an immunity develops. In one chronic case a mummified aborted foetus was encountered. Chronic cases were encountered in bulls. In females the organisms are most readily demonstrated just before abortion or on the return of oestrus. In bulls the irrigation of the sheath with chinosol solution preceded by irrigation with bicarbonate of soda solution gave good results, but animals readily became reinfected. Of the various treatments tried in females the most satisfactory was Albrechtsen's Lugol solution. In cases of pyometra, treatment had often to be repeated several times. Some animals could not be cured, although cases of spontaneous recovery occured. The expulsion of the corpus luteum in cases of pyometra was not

always possible and had to be practised with care. In badly infected areas the disease was considered the most serious bovine malady. Control is urgent. Irrigation of the sheath of the bull before and after service is of great importance and eliminates the transmission of the organism. In cases where several owners use the same bull control as outlined in "the minor system" of Abelein [see *V. B.* **7.** 325] is recommended.

The province of Friesland was omitted from the survey because it is an exporting and not an importing area of breeding stock.—P. L. Le Roux.

Novicky, R. (1945.) La coccidiosis de los cerdos en Venezuela. [**Coccidiosis in swine in Venezuela.**]—*Cuad. verd. 3a Conf. interamer. Agric., Caracas.* No. 12. pp. 29. **50**

Young recently-weaned pigs on two premises in Venezuela had diarrhoea, inco-ordination of movement, retardation of development and some mortality. Examination revealed an infection with *Eimeria deblieckí.* An examination of the herds of pigs concerned revealed an infection rate of 63·95% in pigs aged between 3–6 months, 44·5% in animals between six and 18 months, 25% in sows 1½–4 years old, and 0% in boars 3–4 years old. Examination of 60 trade pigs under movement revealed that 17 were infected, which is thought to indicate a widespread infection of the country. The absence of infection in old pigs is ascribed to immunity acquired after repeated infections. How far coccidiosis is responsible for disease and death in pigs is left undecided.—U. F. Richardson.

Marty, J. (1944.) Le stovarsol sodique et la coccidiose du lapin. [**Stovarsol and coccidiosis in the rabbit.**]—*Rev. Méd. vét., Toulouse et Lyon.* **95.** 136–137. **51**

M. published a note in 1943 which concerned the satisfactory results obtained in the treatment of coccidiosis in rabbits by the use of subcutaneous injections of stovarsol. The present note confirms these results and gives the dosage as follows:– 1·25 g. sodium stovarsol was dissolved in 50 ml. boiled water and each animal was given 5 ml., *i.e.*, 0·125 g. of stovarsol by subcutaneous injection.—C. Horton Smith.

Beltrán, E. (1943.) Adelantos recientes en el conocimiento de los plasmodios de la gallina doméstica (Gallus gallus). [**Plasmodium infection of fowls.**]—*Rev. Inst. Salubr. Enferm. trop.* **4.** 327–335. [English summary.] **52**

This is a review of the literature between 1941 and 1943 dealing with the malarial parasites of fowls. Most of the references deal with infections due to *P. gallinaceum* but there are also references to infections of fowls in Brazil and Mexico caused by *P. juxtanucleare.*—M. C.

Brumpt, E., & van Ty, D. (1945.) Essais négatifs de conservation par le froid (–25°C.) des schizontes, des gamètes et des sporozoites de *Plasmodium gallinaceum.* [**Negative trials in preservation by freezing of schizonts, gametes and sporozoites of** *P. gallinaceum.*]—*Bull. Soc. Path. exot.* **38.** 323–326. Discussion p. 327. **53**

Blood taken from chickens infected with *P. gallinaceum* was placed in a refrigerator at –25°C.; after 16 days the blood was removed to a temperature of 37°C. and then inoculated into another chicken with negative results. In another test, mosquitoes (*Aëdes* spp.) with numerous sporozoites in the salivary glands were placed in the refrigerator for 2–3 min., and were then withdrawn to tubes and allowed to imbibe sodium citrate solution; the tubes were then stored at –25°C. Some weeks later the mosquitoes were transferred to 37°C. and after half an hour they were ground up in citrate and inoculated into the peritoneum of another chicken; the blood remained negative. Failure to infect with frozen and subsequently warmed organisms was constant. Deschiens, in the discussion, reported that much more resistant stages such as the vegetative forms and cysts of certain protozoa, are killed by alternate freezing and warming.—C. H. S.

Pigoury, L. (1943.) Existence d'*Haemoproteus columbae* au Liban. [*Haemoproteus columbae* **in Lebanon, Syria.**]—*Bull. Soc. Path. exot.* **36.** 85–86. **54**

Parasites resembling *Haemoproteus columbae* were observed in the red cells of the pigeon during the examination of blood films. Three months old pigeons were found to be parasitized but there was no evidence that the parasites were pathogenic. This is probably the first record of the occurrence of *H. columbae* in pigeons living in those states of the Levant under French mandate. —C. Horton Smith.

Buck & Lamberton. (1946.) Piroplasmose canine a Madagascar. [**Canine babesiasis in Madagascar.**]—*Bull. Soc. Path. exot.* **39.** 283–285. **55**

Death due to *Babesia canis* was reported in three puppies from an area where *Rhipicephalus sanguineus* had been observed. No previous positive identification of the disease had been made on the island. Its absence in certain areas is apparently due to the absence of suitable vectors. —S. Brian Kendall.

Decourt, P., & Schneider, J. (1943.) Présence d'inclusions dans les mononucléaires du sang périphérique chez les bovins infestés par *Theileria dispar.* [**Inclusions in the mononuclear cells of the peripheral blood in cattle with**

Theileria dispar **infection.**]—*Bull. Soc. Path. exot.* **36.** 59–60. **56**

The authors claim that chromatin granular inclusions occur in the mononuclear leucocytes of cattle infected with *Th. dispar* similar to the bodies they have already recorded in fowls infected with *P. gallinaceum*, and in canaries infected with *P. praecox*.

The inclusions occur both in inoculated cattle and animals infected by ticks, and consist of a chromatin grain surrounded by a clear halo, the diameter varying between 0·7–1·2μ. After inoculation the inclusions appear in a few days, and 10–15 days before the classical theilerial forms, and before any symptoms of disease. The number of infected monocytes increases up to the appearance of erythrocytic invasion, by which time several hundred are present in each blood slide. These forms divide into two by simple fission, but sometimes four elements occur in the form of a cross.—U. F. Richardson.

Kornienko, Z. P., & Shmyreva, M. K. (1944.) O vozmozhnosti peredachi teilerioznoĭ invazii svoemu potomstvu kleshchami Hyalomma turkmeniense (Olenev, 1931). [**On transmission of *Theileria* infection through the egg of the tick *Hyalomma turkmeniense*.**]—*Veterinariya, Moscow.* No. 4. pp. 24–25. **57**

Females of *Hyalomma turkmeniense* were collected from a cow infected with *Theileria annulata*, allowed to deposit their eggs in moist sand, and the larvae and nymphs raised from them fed on rabbits. An attempt was made to raise the immature ticks on mice, but the mice died, as did two out of five rabbits used for this purpose. Of the imagos raised some were fed on a calf free from theilerial infection, and some were sent to Omsk, where theileriasis does not occur, and fed on a bull. The local calf remained healthy, developing theilerial infection in the following spring, but the bull at Omsk developed a theilerial infection 11 days after the ticks were placed on it. The experiment thus indicates that theilerial infection may pass through the eggs of infected ticks to the next generation, this being at variance with the results obtained by earlier workers in Algeria and Tashkent.—U. F. Richardson.

Tselishchev, A. A. (1944.) Vospriimchivost' k teĭlerioziu krupnovo rogatovo skota. [**Susceptibility of cattle to *Theileria* infection.**]—*Veterinariya, Moscow.* No. 4. pp. 25–26. **58**

In order to gain some information as to whether the severity of a *Theileria mutans* infection depends on the strain of theileria or on the susceptibility of the individual host, 12 cattle similar in breed, condition, size, sex and place of origin were inoculated with a strain of the organism, and one animal was infected with the same strain by a tick *Hyalomma marginatum*. The reaction varied considerably in individual animals, and in most cases was severe. No relationship could be established between the number of parasites in the blood and the mortality.

It is concluded that old animals and pure-bred stock are more susceptible to theileria than young animals or humped breeds.—U. F. R.

Dukalov, I. A. (1944.) Profilaktika infektsionnoĭ zheltukhi rogatovo skota. [**Prophylaxis of *Leptospira icterohaemoglobinuriae* in cattle.**]—*Veterinariya, Moscow.* No. 4. pp. 26–28. **59**

A brief resumé is given of the symptoms of infectious jaundice in cattle, and the evidence as to the susceptibility of other animals. In the area concerned, though the disease was prevalent in cattle, no cases were recorded in horses, swine or fowls, although they were closely in contact with diseased cattle. From experimental evidence it is concluded that infection occurs through the mucous membranes. The causal leptospira only occurs in the blood for a few days, and then passes to the internal organs in which it can be most readily isolated from the bladder and urine. The organism has a great power of survival in urine (3–4 months) and will survive in water, particularly stagnant lakes in which possibly some essential organic matter occurs. It is suggested that the essential epizootology consists of the excretion of leptospira in the urine of diseased animals, survival of the organism in dirty watering places and the infection of other animals in drinking.

Observations are recorded on two herds grazing the same pastures, in one of which infection persisted whilst the other remained free. This freedom was supposed to be due to immunity, but eventually the free herd became infected, with a loss of 70%. It was established that this followed a change of watering place. Other cases came under observation in calves using water from artesian wells, but investigations showed that in one case the calves also drank at dirty pools, and in the other that the troughs were too high, and the calves had been using overflow water collected in dirty puddles.

In control of the disease primary measures should be directed to breaking the chain of infection, but in areas where the disease is prevalent it is recommended that a store of serum from convalescent animals should be maintained. This serum is only of value in the early febrile stage of the disease, before the development of symptoms.—U. F. Richardson.

Mulhearn, C. R. (1946.) **A note on the two blood parasites of cattle (*Spirochaeta theileri* and *Bartonella bovis*) recorded for the first time in**

Australia.—*Aust. vet. J.* **22.** 118–119. **60**

S. theileri and *Bart. bovis* are reported in cattle in Australia for the first time, but it is not considered that they are recent introductions. It is suggested that these organisms are transmitted by the cattle tick, *Böophilus australis*. It appears that they are not readily transmitted by blood inoculation carried out in immunizing cattle to anaplasmosis, piroplasmosis and babesiellosis.

—H. McL. Gordon.

See also absts. **184**, **185** (phenothiazine for coccidiosis); **186** (piroplasmosis treated with formalin); **218** (piroplasmosis diagnosis); **226** (trypanosomiasis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Larsen, L. H., & Bendixen, H. C. (1940.) Forsøg, udført Vinteren 1938–39 med Midler til Mildnelse af Mund- og Klovesygeangreb hos Malkekøer. [**Experiments carried out in the winter 1938-39 on ways of minimizing the effects of foot and mouth disease in cows (serum therapy, etc.).**]—*Beretn. Forsøgslab., Kbh.* No. 191. pp. 90. **61**

In a study of experimentally produced F. & M. disease, the authors found that the cow's appetite decreased during the incubation period, but that the milk production was not decreased to the extent that the decreased food consumption might have warranted. However, its decrease was proportional to the severity of the attack and the butterfat percentage increased in proportion to the severity, reaching a maximum of 13%.

Working on various combinations of full rations, half rations, and 200 ml. of convalescent serum given subcutaneously at the time of infection, the authors found that cattle recovered best when given half rations and 200 ml. serum and recovery decreased, in order, when they were given full rations and 200 ml. serum, full rations and no serum or half rations and no serum.

During the incubation period, full rations produced 1·5% more milk. During the convalescent period serum treatment increased milk production 11·2%.

It was found that serum lengthened the incubation period of the disease, ameliorated or prevented clinical symptoms, reduced teat eruptions by 30% and reduced subsequent mastitis by 50%. In animals with vesiculation at the tip of the teat, serum reduced the incidence of subsequent mastitis an average of 22·5%. In those with vesicles at the side of the teat, mastitis was reduced 80% by serum. In those with no vesicles there was an average reduction of 57·2%.

In addition, serum was found to ameliorate hoof lesions and to prevent sloughing of the horn of the hoof. Of those animals that calved while affected, those receiving serum had fewer complications than the others.—Alan G. Warren.

*Holz, K. (1942.) Über Veränderungen am Zentralnervensystem der mit dem Maul- und Klauenseuchevirus infizierten Mäuse. [**Changes in the central nervous system in foot and mouth disease infection in the mouse.**]—*Virchows Arch.* **309.** 185–210. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **144.** 6.] **62**

The lesion was an acute inflammation, with leucocyte migration, nerve cell degeneration and leucocytic neuronophagia, affecting particularly the olfactory, olfactory bulb, hippocampus and pyriform lobe. The changes were not due to the activation of a known (Theiler & Gard's—see *V. B.* **11.** 449—mouse encephalomyelitis) or hitherto unknown mouse encephalitis virus.

—E. Cotchin.

Vaills, L. (1943.) Observations de rage chez le cheval. [**Equine rabies.**]—*Rev. Méd. vét., Lyon et Toulouse.* **94.** 175–177. **63**

A 12-year-old horse was bitten on the lip by a rabid dog: the wound healed. Eight days later 20 ml. of the antirabies vaccine of Remlinger and Bailly was administered subcutaneously, being repeated daily until the horse had received 80 ml. in all. This exhausted the stock of vaccine available and was admittedly insufficient. The horse remained at work until the 21st day after the bite, when the site of the wound became tumified and very irritable. On the 25th day, furious symptoms developed and the animal died.

A four year old stallion developed symptoms 28–30 days after being bitten by a rabid dog that died shortly after [site of bite not reported]. The gait became unsteady and the animal had difficulty in turning but was able to travel 2 km. at a good pace. Spasms of rage were shown but these subsided, although the weakness and signs of paralysis increased steadily. After 30 days a furious spasm developed during which the animal died.

—R. Macgregor.

Tropa, E., & Valente, S. (1944.) Tentativas de recuperação de virus rábico fixo a partir de casos de acidente vacinal e de vacinas. [**Attempts to obtain a fixed rabies virus from dogs accidentally infected during vaccination, and from vaccines.**]—*Rev. Med. vet., Lisboa.* **39.** 458–462. **64**

The authors describe attempts to isolate rabies from the brains of three dogs clinically suspected of post-vaccinal paralysis and also from three batches of Umeno-Doi's formolized vaccine and conclude that the dogs died not from fixed

rabies virus but as a result of post-vaccinal infection with street virus.—H. G. ARAMBURU.

RICKARD, E. R., THIGPEN, M. P., & ADAMS, J. M. (1945.) **Antibody response to strains of influenza A and swine influenza viruses in the serums of infants experiencing their first infection with influenza A.**—*J. infect. Dis.* **76.** 203–207. **65**

The authors describe the antibody response of infants to their first infection with influenza virus type A. This is ascertained from the serum reactions taken at the onset, convalescence and late convalescence of the disease. Materials and methods are fully discussed. Four strains of virus were used. The antibody response was ascertained by agglutination inhibition and neutralization tests.

The results showed that in these infants no demonstrable neutralizing antibodies were found in the acute phase. These findings suggested that the infection was the first exposure to the influenza virus. In the convalescent tests, neutralizing antibodies were found in all sera with the highest concentrations to the strain causing the outbreak and progressively lower in the other strains, swine influenza being lowest.—W. R. KERR.

ENGEL, L. L., & RANDALL, R. (1947.) **Some relations between equine encephalomyelitis virus (Eastern type) and normal host cellular constituents.**—*J. Immunol.* **55.** 331–336. **66**

An attempt was made to determine whether equine encephalomyelitis virus of chick-embryo origin possessed any antigenic groupings characteristic of normal chick embryo tissue. Quantitative precipitin reaction tests were carried out using antiserum to purified normal chick embryo proteins and antigen preparations of normal chick embryo proteins and virus purified by differential centrifugation. From the results of these tests the authors conclude that purified virus preparations contain approximately 56–77% of components antigenically related to normal chick embryo tissue components.—W. M. HENDERSON.

GLÄSSER. (1943.) Die enzootische Bronchopneumonie des Schweines. Schweinegrippe. **[Enzootic broncho-pneumonia in pigs. Swine influenza.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Nov. 26th. 403–406. **67**

The author reviews the history, clinical features and etiology of swine influenza as it occurs in Europe and discusses briefly the European form with the American. Two forms are reported in Europe, a severe disease of young pigs and a milder disease of store pigs, both of which bear less resemblance to influenza of man than the American disease.—W. M. HENDERSON.

ZUBAJ, J. (1946.) Rozšírenie a tlmenie nákazlivej obšírny opaných na Slovensku v rokoch 1940–1945. **[Spread and control of Teschen disease in Slovakia in 1944-45.]**—*Čas. československ. vet.* **1.** 187–194. **68**

The first cases of porcine encephalomyelitis occurred in Slovakia in 1936, but until 1940 only sporadic cases had been reported. Since then the disease spread rapidly, with 924 cases in 1940, 1,397 cases in 1941, 622 cases in 1942 and 316 cases in 1943: statistical data are not available for 1944–45 because of war activities.

Diagnosis of porcine encephalomyelitis was made by histological examination of the brain. Differentiation from swine fever and Aujeszky's disease was not difficult.

Protective vaccination against porcine encephalomyelitis was unsatisfactory. It was therefore evident that the efficacy of a campaign against the disease was dependent upon the rigid application of sanitary police measures. In 1940 the Czech Ministry of Agriculture issued control regulations involving the proper disposal of dead, infected or suspected animals, the isolation of infected premises and the cleaning and disinfection of stables, yards and barns. Pigs from infected herds were slaughtered and the meat could only be sold cooked and under veterinary supervision.

This policy of slaughtering out was successful in the eradication of the disease and at the time of writing infection occurred only sporadically. This method is, however, very expensive and Z. considers that in future, attention should be devoted to the question of protective immunization.—E. PŘIBYL.

RIEDMÜLLER, L. (1943.) Die ansteckende Schweinelähmung im Engadin und Bergell. **[Porcine infectious encephalomyelitis (Teschen disease) in the Engadine and Bergell.]**—*Festschrift Oskar Bürgi*, 1943. pp. 275–291. Horgen-Zürich: Fritz Frei. [In German.] **69**

An account is given of cases of Teschen disease occurring in Engadine and Bergell in 1940–41, following the entry of the disease into Switzerland in 1940. Aspects of the disease dealt with include laboratory diagnosis, mode of spread, properties of the virus, clinical picture and differential diagnosis, and control measures. In these Swiss cases, the diagnosis was confirmed by the positive results of the intranasal and intracranial inoculation of brain and cord suspensions into young pigs (including swine fever immune animals) and the failure to infect rabbits (thus eliminating Aujeszky's disease). The exact method of spread of the infection was obscure, but it often appeared to be by blood and offal, for example from home-killed pigs, and often seemed to follow the route of commerce. The spread of the disease was apparently checked by a slaughter

policy on affected and sometimes on in-contact premises, followed by the proper disposal of the carcasses, and disinfection and a period of rest of the premises. The incubation period (in the experimental cases) varied from 7–13 days, followed by fever, lasting 2–4 days, loss of appetite, and apathy: in some natural cases, these last symptoms might be almost unobservable, and abortive cases recovered with acquired immunity after merely showing a temperature rise. In the next stage, at or just before the beginning of which the temperature fell to or below normal, the characteristic paralytic symptoms of the disease appeared.

Diseases to be considered (sometimes only rather remotely) in the differential diagnosis would include: acute swine fever, Aujeszky's disease, rabies, intestinal parasitism, purulent encephalitis complicating "transport" polyarthritis, rickets (tetany), and poisoning.—E. COTCHIN.

ANON. (1946.) **A review of Newcastle disease.** pp. 6. Washington: U.S. Department of Agriculture, Agricultural Research Administration, Bureau of Animal Industry, Pathological Division. 4to. Mimeographed. **70**

The publication gives a short account of Newcastle Disease in North America; it deals briefly with the symptoms, differential diagnosis and control of the disease. [The review is dated August 30, 1946, and therefore no reference is made to any of the important work published since that date.]—J. D. BLAXLAND.

I. MAAS. (1943.) Zur Geflügelpest. [**Fowl plague.**]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Sept. 3rd. 296–300. **71**

II. BECK, A. (1943.) Schutzimpfung gegen Geflügelpest. [**Vaccination against fowl plague.**] —*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Sept. 3rd. 300–302. **72**

I. A report of an outbreak of fowl plague in Westprignitz in 1942 during which a vaccine was used consisting of a 20% saline suspension of infected chick embryos with 0·5% formalin. [See TRAUB, *V. B.* **15.** 264.] Each vaccinated fowl received a single dose of 2 ml. i/m. In vaccinated flocks comprising 215 fowls there was 82% morbidity and 2·8% mortality compared with 100% morbidity and 55% mortality in unvaccinated flocks comprising 370 fowls. [It is not clear whether the virus responsible for this series of outbreaks was a strain of classic fowl plague virus or whether it was similar to the strains of atypical fowl plague virus isolated by TRAUB, see *V. B.* **13.** 90.]

II. A field trial is described of the use of Traub's aluminium hydroxide adsorbed vaccine prepared from the "Braunfels" strain of fowl plague virus. The dose of vaccine used was either a single injection of 1 to 2 ml. or two injections of 1 ml. i/m. From 5 to 38 days after a single dose of 2 ml., out of 42 flocks (815 fowls), 11 flocks (275 fowls) became infected with a morbidity of 31% and a mortality of 27%. The results following the 1 ml. or the 2 × 1 ml. doses were less conclusive as half the fowls contracted and subsequently died of fowl plague within five days of vaccination.—W. M. HENDERSON.

SPEARS, H. N. (1946.) **Immunisation against fowl plague with crystal-violet vaccine.**—*J. comp. Path.* **56.** 160–169. **73**

Attempts to produce immunizing agents with fowl plague virus have generally been unsuccessful. S. describes the passage of the virus in the developing egg and the production of an immunizing agent by incubating the egg material at 37°C. in the presence of crystal violet.

At intervals during 200 serial passages on the chorio-allantois, the virus was titrated by inoculation of serial dilutions, each dilution being given to two fowls. Death of the inoculated birds indicated the highest dilution infective and this dilution was taken as the end-point. From eight titrations, using a total of 68 birds, S. concludes that the virus appears to have been considerably exalted in virulence by passage and to have reached its maximum at the 45th–60th passage and to have subsequently decreased to become more or less constant.

The vaccine studied consisted of eight parts of 10% embryo suspension from infected eggs, one part of 3% aqueous disodium phosphate, and one part of 0·5% crystal violet, Dupont. It was found to be inactivated after 48 hours at 37°C. 5 ml. given subcutaneously to fowls failed to produce the disease and three weeks later these fowls were found to resist subcutaneous inoculation of approximately 10^6 M.L.D. of virus. A satisfactory immunity was produced by 1 ml. of vaccine, but 5 ml. doses were used in tests of rate of development of immunity. It was found that 14 days was the time taken for treated fowls to become resistant. Immunity appeared to wane somewhat at three months. It is emphasized that immunity to contact infection might be expected to develop more quickly and to last longer. Vaccine stored six months at –4°C., 7°C. and 18°C. retained its immunizing properties.

[In table I an error has occurred. 2×10^{-6}, 3×10^{-6}, etc., have been printed where obviously $\frac{1}{2 \times 10^6}$, $\frac{1}{3 \times 10^6}$, etc., were intended. S. is not correct in presuming that minute errors in initial dilutions must become proportionately exaggerated in later dilutions.]—J. B. BROOKSBY.

Gross, W. O. (1943.) Selbstimmunisierung der weissen Mäuse gegen filtrierbare Pneumonieerreger. **[Auto immunization of white mice against the filtrable pneumonia virus.]**—*Z. ImmunForsch.* **103.** 150–153. **74**

The finding of resistant mice among stocks from which the "Schandau" and the "Greifswald" strains of mouse pneumonia virus had been isolated led G. to perform some experiments on the development of immunity in mice following contact with sick mice and following eating infected mouse lung. Mere contact was found to produce neither illness nor immunity whereas mice fed on infected lung subsequently resisted intranasal instillation of the virus suspension. G. concludes that in stocks of mice the spontaneous case of mouse pneumonia will lead to the development of immunity in those cagemates that gnaw the carcass and so groups of resistant mice will be built up.—W. M. H.

Lawson, R. B., & Melnick, J. L. (1947.) **Inactivation of murine poliomyelitis viruses by heat.**—*J. infect. Dis.* **80.** 201–208. **75**

Experiments were performed to determine the loss of infectivity of various strains of mouse adapted and spontaneous mouse poliomyelitis viruses when heated in milk as well as in water. Water and milk suspensions of infected brain and cord tissue were markedly reduced in titre when heated at 45° and at 50°C. respectively, but the temperature had to be raised to above 60°C. before the last traces of active virus were removed. In general, milk suspensions required a temperature about 5°–10°C. higher for inactivation than water suspensions.—W. M. Henderson.

Philip, C. R. (1947.) **Observations on Tsutsugamushi disease (mite-borne or scrub typhus) in northwest Honshu Island, Japan, in the fall of 1945. I. Epidemiological and ecological data.**—*Amer. J. Hyg.* **46.** 45–59. **76**

Details are given of incidence in human beings; methods of infection are discussed and also the arthropod vectors. There are observations on the epidemiology of the disease. The Japanese field vole (*Microtus montebelli*) and a mouse-like rat (*Apodemus speciosus*) serve as hosts of the transmitting mites, but it was not considered that their nests are an important source of infestation by the mites.

Sureau, B. (1945.) Élimination d'agglutinines antirickettsies par les urines albumineuses du lapin inoculé par voies dermique ou péritonéale. **[Excretion of antirickettsial agglutinins in albuminous urine of rabbits inoculated intradermally or intraperitoneally with typhus rickettsia.]**—*Bull. Soc. Path. exot.* **38.** 185–187. **77**

S. endeavours to show a relationship between the excretion of agglutinins in an artificially produced condition of albuminurea and the level of agglutinins in the blood. Two rabbits were inoculated with lung material from a rabbit infected with rickettsia and an estimation was made of the titre of agglutinins in the blood and in the urine in the presence of an albuminurea artificially induced by injection with "muthanol", a suspension of bismuth hydroxide and mesothorium in olive oil.

The titre of the agglutinins was estimated after removal by filtration of substances causing non-specific agglutination and after adjusting the pH slightly to the alkaline side of neutrality. The amount of agglutinins in the urine appeared to be linked with the amount of albumin in the urine. There was a slight fall in the blood level of agglutinins at the time of the excretion through the urine.

Results were not conclusive as the method of estimating the titre of the agglutinins was not very precise.—S. Brian Kendall.

See also absts. **116** (Rous sarcoma); **226** (rinderpest); **229** (rabies).

IMMUNITY

Kabat, E. A., & Bezer, A. E. (1945.) **Immunochemical studies on blood groups. I. Estimation of A and B isoantibodies in human serum by the quantitative precipitin method.**—*J. exp. Med.* **82.** 207–215. **78**

Kabat, E. A., Bendich, A., & Bezer, A. E. (1946.) **Immunochemical studies on blood groups. II. Properties of the blood Group A substance from pools of hog stomachs and of specific precipitates composed of "A" substance and homologous human antibody.**—*Ibid.* **83.** 477–484. **79**

Bendich, A., Kabat, E. A., & Bezer, A. E. (1946.) **Immunochemical studies on blood groups. III. Properties of purified blood Group A substances from individual hog stomach linings.**—*Ibid.* **83.** 485–497. **80**

[Authors' summaries copied *verbatim*.]

I. With purified blood group A and B specific substances from the gastric mucin of pigs precipitin reactions can be obtained in sera containing homologous isoagglutinins. By microquantitative precipitin technics the anti-A and anti-B content of normal and immune isoagglutinin-containing sera can be estimated on a weight basis. There was a general correlation between

antibody N precipitable from the sera of groups O and B by A substance and the agglutinin titer for A erythrocytes before and after immunization with blood group substances. The reaction between A substance and its homologous iso-agglutinin present in the sera of immunized individuals was of the same type as in other antigen-antibody systems.

II. The microquantitative precipitin method can be used to compare the relative activity of different preparations of the blood group A substance from hog stomachs and to study the effect of chemical treatment upon its stability. With samples of about 25 μg. antibody nitrogen, an error of ± 1·7 μg. antibody nitrogen will result in an error of 12% in the estimation of the amount of A substance. The blood group A substance showed no significant loss of activity at 37°C. after 48 hours at pH 1·07–10·7 or after two hours at 100°C. over a pH range from 2·97–7·58. Exposure at 100°C. at pH 1·03 or at 9·03 or higher resulted in loss of activity. Parallel results were obtained by the hemagglutination inhibition and quantitative precipitin methods. The solubility of specific precipitates of the blood group A substance from hog stomach and its homologous antibody formed in man was found to be about 1·6 μg. antibody N/ml. A comparison is given of the chemical properties and activity of blood group A substances obtained by several procedures from pools of hog stomachs.

III. Studies on a number of individual hog stomachs have shown that substances with blood group A activity cannot be obtained from all hogs. Of ten stomachs studied, only seven yielded products with blood group A activity. All ten purified preparations, however, showed identical properties with respect to nitrogen, reducing sugar, glucosamine, acetyl, and relative viscosity. Six of the seven active samples were of equal potency in precipitating anti-A; the seventh was slightly less active. Preparations from random pools of hog stomachs, although possessing the same analytical properties, were of lower activity than those from individual active stomachs as determined by the microquantitative precipitin method. An immunochemical method for estimating the absolute purity of the blood group A substance by determining the proportion of its glucosamine precipitated by excess anti-A was developed. Values of about 84% for the purity of six of the seven purified active preparations from the individual hog stomachs were obtained. The inactive products, unlike the active ones, did not stimulate the production of anti-A on injection into human beings and did not precipitate anti-A or inhibit hemagglutination of A erythrocytes by anti-A.

BODIN, S. (1945.) Vissa synpunkter rörande en rationell framställning av rödsjukeserum. [**Some points about the rational preparation of swine erysipelas antiserum.**]—*Skand. VetTidskr.* **35.** 385–418. [Abst. from English summary.] **81**

B. gives an account of experience gained by immunization experiments carried out mainly during 1944 on about a hundred horses which were used for the production of swine erysipelas serum. The horses were old army animals, comprising both thoroughbreds and draught horses. For immunization intravenous, intravenous-subcutaneous and subcutaneous methods were used besides special experimental methods. B. describes the method of standardizing and testing the serum obtained from the immunization in accordance with the norm of immune body content corresponding to at least 50 Swedish immunization units (about 200 German I.E. per ml.) as a minimum requirement. (The average duration of immunization, the number of injections required and the amount of culture broth needed were all considered in testing and approving the serum.)

From the results he obtained, B. ventures the following statement:

The method of injection has a bearing on the duration of the immunization period: intravenous injections give the shortest periods and the risk of horses having to be condemned on account of deficiency in the formation of antibodies is least when this method is used.

Results obtained from the intravenously immunized group led B. to the conclusions that 1. On an average thoroughbred animals require shorter immunization periods than work horses. 2. The percentage of horses condemned on account of poor antibody formation is lower for thoroughbreds (5·7%) than for work horses (10·3%). 3. Age is significant, in that older horses (11–19 years) give shorter immunization periods (average 84 days) than younger ones (average 106 days), and in these age groups the thoroughbreds have shorter immunization periods than the work horses.

B. considers that the method of injection affects the immune body content as follows:– 1. Immune values well above the norm of 50 Swedish immunization units are usually found in horses intravenously injected. 2. The thoroughbreds appeared in this group more frequently (57·7%) than work horses (41·4%).

The frequency of arthritis is about equal for all methods (42·4%, 44·4% and 45·5% in intravenous, intravenous-subcutaneous and subcutaneous immunization respectively. Whatever method is used this frequency is highest in horses with higher serum titres.

Experiments are described in which the

following three types of swine erysipelas immunization material were used :– 1. avirulent strain ; 2. bacilli killed with trypaflavine ; 3. frequently repeated small doses of virulent broth culture.

Comparative tests of the sera from other laboratories showed that varying titre values existed not only between sera from various makers but also between those from one and the same manufacturer.

B. stresses the importance of control of the antibody status of horses during immunization and later during the production period. A minimum antibody content of the serum should be guaranteed by producers, and he proposes the creation of an international system of standardization based on the norm of 50 Swedish immunization units.—F. E. W.

See also absts. **7** (anthrax vaccine) ; **27** (*Br. abortus*) ; **43** (trypanosomiasis) ; **48** (in trichomoniasis) ; **61** (foot and mouth disease) ; **65** (influenza antibodies) ; **72, 73** (fowl plague) ; **106** (c.f. test for trichiniasis) ; **107** (antigen in filariosis) ; **109** (effect of diet on immunity to nematode infection).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

HATHAWAY, C. R. (1943.) Associação entre *Mallophaga* e *Hippoboscidae*. [**Commensalism of biting lice and hippoboscid flies on a pigeon.**] —*Mem. Inst. Osw. Cruz.* **38.** 413–417. **82**

H. found a fly on the feathers of a pigeon while working in the laboratory. The fly proved to be *Pseudolynchia canariensis Macquart* attached to its abdomen there were seven *Columbicola columbae.*

H. points out that this is not an original finding as the fact was first described by Aubé (1851). A comprehensive list of references is given.—H. G. ARAMBURU.

ULIBARRI, F. F. (1944.) Breve nota sobre un caso de miasis subcutánea producida por la larva de la ¿ Hypoderma bovis ? o la ¿ Hypoderma lineatum ? [**Brief note on a case of subcutaneous myiasis produced by the larva of *Hypoderma bovis* and *H. lineatum*.**]—*Rev. Sanid. Hig. publ., Madr.* **18.** 75–76. [Abst. in *Zbl. Bakt. I.* (*Ref.*). **145.** 160. (1944).] **83**

A six-year-old child developed a subcutaneous tumour which opened spontaneously and from which a maggot emerged. The characters of the maggot are described. It was identified as either *H. bovis* or *H. lineatum*.—M. C.

GASCHEN, H. (1944.) La répartition des tsétsés en fonction du climat. [**The influence of climate on tsetse flies.**]—*Bull. Soc. Path. exot.* **37.** 172–175. **84**

The ecology of an area governs its suitability for any particular species of tsetse fly, and mainly depends on the temperature and relative humidity of the atmosphere, which can be depicted graphically. This correlation of ecology and climatic conditions with the various species of tsetse fly is illustrated by an analysis of the conditions in the various areas of the Ivory Coast of West Africa.—U. F. RICHARDSON.

GASCHEN, H. (1944.) L'utilité du climogramme pour l'étude de la biologie des Tsétsés. [**The climogram in the study of the biology of the tsetse fly.**]—*Bull. Soc. Path. exot.* **37.** 176–182. **85**

Mean relative humidities and monthly temperatures were ascertained for 14 habitats of *Glossina palpalis*, 12 habitats of *G. tachinoides* and nine habitats of *G. submorsitans.*

G. tachinoides and *G. submorsitans* appear to require similar conditions, the mean monthly temperatures for the former ranging between 23·9°C. and 30·2°C. and for the latter between 24·9°C. and 29·6°C. *G. palpalis* appears to live in an environment having a smaller temperature range, the lower and upper limits being 22·2°C. and 23·8°C. respectively.

G. palpalis was not found under conditions of relative humidity less than 62·2%. *G. tachinoides* and *G. submorsitans* on the other hand live in environments where the relative humidity was at some times as low as 39·2% and 40·9% respectively.

It is suggested that the suitability of an environment for a particular species of Glossina may be determined and hence the degree of danger of invasion of previously uninfected areas.

—S. BRIAN KENDALL.

CASSAMAGNAGHI (HIJO) A. (1946.) Miasis primitiva. A forma cutaneo-forunculosa en las aves del Uruguay. [**Primary myiasis with furunculosis in birds in Uruguay, due to *Phaonia* sp. (Muscidae).**]—*Bol. men. Direcc. Ganad., Montevideo.* **29.** 517–530. [French summary.] **86**

A form of myiasis is described in nestlings of buntings, and other species of birds, in which invasion with larvae results in tumourous formations in the subcutaneous tissue in various parts of the body, and the death of the bird. Flies raised from the larvae proved to belong to a soecies of *Phaonia* which is thought to be a new species on account of its wing venation. It is proposed to name this species after Prof. Gaminara.—U. F. RICHARDSON.

BOERO, J. J., & D'ANGELO, E. (1946.) Biologia del " Boophilus microplus ", garrapata comun de los bovinos. [**Biology of *Boophilus microplus.***] —*Bol. tec. Direcc. gen. Ganad., B. Aires.* pp. 5–11. **87**

A description is given of the anatomical changes occurring during the development of male and female *B. microplus*, from the emergence of the larvae to the attainment of sexual maturity, with illustrations of the changes at about 24-hour intervals. The time taken in development in the two sexes is approximately equal in the early stages of the two sexes, but whilst the male requires only a day to develop from the fully formed metanymph to the immature adult, and two days from that stage to adolescence, the female requires three and six days respectively for these changes.—U. F. RICHARDSON.

BEKKER, P. M., & GRAF, H. (1946.) **Gammexane and D.D.T. dips for control of arsenic-resistant blue tick.**—*Fmg S. Afr.* **21.** 361–368. **88**

An interim survey of dipping experiments against the arsenic resistant strain (first found about 1937 in the East London area) of the Blue Tick (*Boöphilus decoloratus*), indicates that with weekly dipping in an emulsion containing 0·1% D.D.T. (active isomer) this tick is controlled. The protection given by D.D.T. against reinfestation is of short duration. The same is true with a 0·5% D.D.T. (active isomer) dip for the Red Tick (*Rhipicephalus evertsi*), and which also controls the horn fly (*Lyperosia irritans*). Gammexane emulsions containing 0·005% gamma isomer under similar conditions also gave complete control of the Blue Tick. The fecundity of female ticks, which survive on cattle that were dipped in this latter dip or in one of 0·5% D.D.T. (active isomer), was markedly reduced.

The question whether arsenic is an essential addition to these emulsions in order to preserve the D.D.T. and gammexane for long periods, is raised, but at this experimental stage cannot be answered.—LEWIS DAVIES.

LEITÃO, J. S., & LINA DE SOUSA, J. M. (1943.) Fragmentos de insecto na cavidade abdominal dum suino. [**Fragments of insects in the abdominal cavity of pigs.**]—*Rev. Med. vet., Lisboa.* **38.** 378–381. **89**

The authors report the finding of fragments of an insect in the abdominal cavity of a pig examined in the slaughter house. The fragments were encysted on the peritoneum and were located near the site of a spaying operation.

Small fragments of food and other intestinal contents were found in similar situations in other pigs, in which the bowel may have been perforated during the spaying operation.—MILLER WATSON.

RODHAIN, J., & VAN OYE, E. (1941.) Sur le rôle d' "*Argas reflexus*" dans la transmission du paratyphus des pigeons. [**The role of *Argas reflexus* in the transmission of paratyphoid in pigeons.**]—*Acta biol. Belg.* **1.** 216–220. [Abst. in *Bull. Inst. Pasteur.* **43.** 96–97. (1945).] **90**

Many pigeons are infected with *A. reflexus* and paratyphoid due to an organism like *S. typhimurium* is fairly common. The authors therefore investigated the possible relationship between the ticks and the organism, using a strain virulent for birds and mice.

In the first experiment the survival time of salmonella in ticks was studied by feeding various lots of ticks on infected canaries and finches and then examining the coelomic fluid. Up to the time of writing, salmonella had survived 101 days in one tick, as proved by the inoculation of laboratory animals. In a second experiment, four ticks which had fed on an infected finch were allowed to feed on a second. Two were examined by puncture and gave positive cultures, but the finch remained free of salmonellosis. Eight ticks fed on an infected finch were allowed on to a young mouse; one tick was shown by puncture to be infected, but the mouse remained free of infection. From this it seemed hardly probable that infection was transmitted by the bite of the ticks.

A study was also made of the eggs laid by infected ticks. Nine eggs from a tick later found to be infected were washed in physiological saline triturated aseptically and cultures made, with negative results. There was no indication that infection could be transmitted from the tick to the egg.

It is possible that pigeons become infected by eating ticks. Another theory is that mice become infected by eating the ticks and that pigeons may pick up the infection through eating grain contaminated by the mice.—S. M. G.

RUSSEFF, C. (1943.) Die Schafräudebekämpfung in Süddobrudscha. [**Sheep scab (*Psoroptes communis* var. *ovis*) in Southern Dobruja (Bulgaria).**]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 90–91. **91**

R. describes an outbreak of sheep scab in Bulgaria which became widespread following the transfer of population which resulted from the 1940 treaty between Bulgaria and Roumania, by which Southern Dobruja was ceded to Bulgaria.

At the time of writing, there were approximately 800,000 sheep in Southern Dobruja, of which about 200,000 belonged to the migrants from the north. Inspection at the border revealed that many sheep were affected, but there was no opportunity of treatment during the transfer. Cold and poor food favoured the spread of the disease which then affected native herds. In 1941 it was estimated that 20% of all sheep were visibly affected; the same year 2,351 sheep died of cachexia following the disease and in 1942, 61,470 died. Approximately 36,000 lambs died on account of weakness in the ewes. Wool losses

totalled approximately 90,000 kg., milk losses 3,300,000 litres. The loss in meat was even greater.

For treatment, wherever possible, a Bayer preparation, " antisarnico," was used eventually. This preparation was available in 4 : 1,000 water solution and was further diluted 3 : 1 in water, being used as a dip. The cost of this preparation was small and all ectoparasites were killed by it. 615,676 sheep received one dip but less than a fifth of these could receive a second dip, owing to shortage of materials. By the beginning of 1942 all the obvious signs of the disease had disappeared, although further outbreaks were likely after the severe winter. The sheep were again dipped, some up to four times. All treated sheep recovered.

Treatment was accompanied by a campaign against the parasite in pasture and stalls, sheep being kept from pasture for 1–2 months, or the pasture being dressed with lime.

Previously babesiasis had caused heavy losses in sheep in summer but after treatment for scab the number of cases diminished. In 1942 there was no case reported.—S. M. G.

ARAUJO, T. L. (1941.) Sobre a ocurrência no Brasil da sarna psórotica dos caprinos e da sarna notoédrica do gato doméstico. **[Psoroptic mange in goats and *Notoëdres* infestation in a cat in Brazil.]**—*Rev. Fac. Med. vet. S. Paulo.* **2.** 27–28. **92**

A brief note on these two conditions. The sites of infestation were the ears and the head respectively.—MILLER WATSON.

TROPA, E., & DIAS, S. (1943.) Notas parasitológicas. I. Subsidios para a corografia parasitológica do Norte. **[Notes on Parasitology. I. Some details of the incidence of parasites in northern Portugal.]**—*Rev. Med. vet., Lisboa.* **38.** 261–265. **93**

This note presents a table of the endo-parasites and ecto-parasites of domestic animals identified in northern Portugal.—MILLER WATSON.

MARAMBIO, J. A. (1944.) Contribución al estudio de los metazoos parásitos del perro. **[The metazoan parasites of the dog.]**—*Agric. téc., Chile.* **4.** No. 1. 59–71. **94**

A total of 64 dogs was examined for metazoan parasites, each dog being subjected to a complete necropsy. Faecal examinations were also carried out. The dogs were of several breeds, mostly mongrels, and of different sexes, with ages ranging from a few months to many years ; they were in varying states of health. Parasites of 16 different species were found, all 64 dogs bearing at least one species of parasite. *Trichodectes canis*, which has been described in the literature, was not found.

Tables are given showing the breed, age, sex, and general condition of each dog ; the results of the faecal examination of each dog ; and the numbers of the various species of parasites recovered from each dog.

Mixed infestations were the rule, a single dog carrying up to eight species of parasite. In 47 cases heavy infestations were encountered. All but two dogs harboured *Dipylidium caninum*, of which the heaviest infestation was 600. The age and condition of the dogs had no bearing on the incidence of this parasite. Four dogs carried *Taenia pisiformis*, two had *T. hydatigena* and there was a single case of *T. serialis*, in which the infestation amounted to 150 worms. One dog was infested with *Echinococcus granulosus*.

Ancylostoma caninum was found in 27 dogs, the heaviest infestation being 100 parasites. Again the incidence was not affected by condition. *Toxocara canis* was found in 25% of the dogs, most of them young. The heaviest yield was 22 specimens. There were 15 instances of *Toxascaris leonina*, 62 being the greatest number found in a single dog. Infestation with this parasite was not influenced by age or condition. Mixed infestations of *T. canis* and *T. leonina* were found in three cases. Only one dog carried *Trichinella spiralis*.

The nasal cavities of 11 dogs contained *Linguatula serrata*, the maximum number found being 18 specimens, but there were no lesions in any of the nasal cavities examined. *Ctenocephalis canis* occurred on 61 of the dogs and *Pulex irritans* on 15. *Heterodoxus longitarsus* was found on 19 animals and *Linognathus setosus* on four, of which two bore extraordinarily heavy infestations. Two dogs carried *Sarcoptes scabiei* var. *canis*.—R. P. HILL.

STEWARD, J. S. (1946.) **Application of " Gammexane " to arthropods of veterinary importance.**—*Nature, Lond.* **158.** 636–637. **95**

Good protection is claimed against the sheep blowfly (*Lucilia sp.*) using a 0·5% spray, also against *Stomoxys*, *Melophagus*, various biting and sucking lice, fleas, several genera of ticks, rat mange, chorioptic mange of horses, and the poultry red mite (*Dermanyssus gallinae*). Gammexane was found to be very effective even with great dilutions. Its toxicity to the aquatic larvae of *Culicoides nubeculosus* and *Simulium* (species not given) appears to be exceptionally high. The larvae of *Hypoderma* in the back of cattle, and *Gastrophilus* larvae *in vitro* are relatively insusceptible. This is an interim report.—LEWIS DAVIES.

See also absts. **1** (ticks and pyaemia in lambs) ; **57** (ticks on theileriasis) ; **76** (mites and scrub typhus) **187, 188** (mange) ; **190-194** (D.D.T. and other insecticides).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

CANHAM, A. S. (1946.) **Cysticercosis in calves in Natal.**—*J. S. Afr. vet. med. Ass.* **17.** 169–171. **96**

Attention is drawn to the young age at which calves may become infested with *Cysticercus bovis*. Two calves, each three weeks old and slaughtered at Pietermaritzburg abattoir, were shown to be infested. In the Annual Report of the Medical Officer of Health, Pietermaritzburg, for 1944-45, it is stated that of 3,682 calves slaughtered 3·69 % were condemned for measles. The youngest age at which measles was diagnosed was ten days.—J. N. OLDHAM.

PINTO, C., & VAZ, Z. (1938.) Localisações erráticas do "Parascaris equorum" (Goeze, 1782) no coração do cavalo e "Ascaris lumbricoides" L., 1758 Nas vias biliares do carneiro e mesentério de criança. **[Unusual localization of *Parascaris equorum* in the heart of a horse and of *Ascaris lumbricoides* in the bile duct of a ram and in the mesentery of a child.]**—*Rev. Fac. Med. vet. S. Paulo.* **1.** 53–55. [English Abst.] **97**

The authors record *Parascaris equorum* (male) in the left ventricle of a horse, also *Ascaris lumbricoides* in the bile duct of a ram. The anterior end of the former was deeply embedded in the heart muscle. Eggs of *A. lumbricoides* are recorded from the mesentery of a child.—MILLER WATSON.

SPRENT, J. F. A. (1946.) **Some observations on a disease of zebu cattle associated with infestation by the hookworm,** ***Bunostomum phlebotomum.***—*J. comp. Path.* **56.** 149–159. **98**

S. describes a disease of yearling zebu cattle which occurs in Northern Nigeria during the dry season of January to April. It is characterized by progressive emaciation and exhaustion, with the development of an aplastic anaemia, and usually terminates fatally in a few weeks. The condition has occurred for a number of years, appearing in January and disappearing when the rains start. P.M. findings of affected animals, killed *in extremis*, are recorded and notes on pathological histology given; the heart and liver showed signs of cellular degeneration and the presence of abnormal fat. An account of the blood picture is also given and although it appears that the anaemia was due to dysfunction of the bone marrow, rather than to the disruption or loss of erythrocytes, it was not possible with the available evidence to explain its aetiology. In its incidence, however, the disease bears some relationship to the degree of infection by *Bunostomum phlebotomum* occurring at a time of the year when the hookworm burden of nomadic cattle was found to be maximal. In addition, the symptoms and lesions resemble those reported by other observers who attribute pathological significance to this parasite.

S. points out that the evidence is entirely circumstantial and until more is known of the activities of the hookworm in the intestinal tract the aetiology of the condition must be left undecided.—J. N. OLDHAM.

GOLDSBY, A. I., & EVELETH, D. F. (1946.) **Diagnosis of internal parasites in sheep.**—*Vet. Med.* **41.** 398–403. **99**

The authors describe briefly the techniques used in the laboratory of the North Dakota Agricultural Experiment Station for the diagnosis of helminths in the alimentary tract of sheep. After discussing the advantages and disadvantages of a faecal egg count and a P.M. examination, the procedure for collecting faecal samples to make a flock diagnosis is outlined. This involves the use of a collecting bag made of non-water-proofed canvas and straps. The measurements and construction of the bag are shown in an illustration. The use of such a bag, attached to the animal between the hind legs, eliminates contamination of the faeces by free-living nematodes. If not examined in the laboratory within 5–8 hours after deposition in the bag, faeces are transferred to small waxed cartons and quickly frozen. Frozen samples may be kept indefinitely but after thawing out must be treated in the same manner as fresh samples. Egg counts are made by the Whitlock method.

To examine the viscera the procedures adopted are those normally used in most laboratories. If examination is delayed the specimen is either frozen or preserved with formaldehyde. To examine the small intestine use is made of a scraping and splitting device. This mounted enterotome consists of a ¾ in. pipe 40½ in. long, one end of which is threaded so that a nozzle with a shoulder to hold the scraper, a washer, can be screwed in. The other end of the pipe is connected to a water supply by a hose. Washers of different sizes and large enough to stretch the intestine and scrape the mucous membrane are used with sheep of different ages. Water flowing from the nozzle aids in washing parasites free from the intestine which is pushed over and up the pipe until it reaches and is cut open by a triangular splitting knife attached to the pipe. The device is figured and measurements are shown. The numbers of parasites, based on Swales' data, considered harmful to a sheep are given as more than: 500 *Haemonchus*, 8,000 *Ostertagia circumcincta*, 10,000 *Trichostrongylus* spp., 10,000 *Cooperia curticei*, 100 *Chabertia* and 100 *Oesophagostomum*

columbianum. Tapeworms are weighed and *Moniezia* infestations exceeding 25 g. per lamb are considered harmful.—J. N. OLDHAM.

JOYEUX, C., & GAUD, J. (1943.) La pneumonie vermineuse des ovins au Maroc. [**Verminous pneumonia in sheep in Morocco.**]—*Bull. Soc. Path. exot.* **36.** 232–235. **100**

This is a preliminary note on work to be published in due course in the Archives de l'Instit. Pasteur du Maroc. *Dictyocaulus filaria*, *Protostrongylus rufescens*, *Cystocaulus ocreatus* and *Mullerius capillaris* have been found in the lungs of sheep and goats in various parts of Morocco. The part played by various molluscs in the life cycle of the last three of these nematodes is noted and the possibility of biological control of the larvae is considered.—D. LUKE.

I. FRANKLIN, M. C., GORDON, H. McL., & MACGREGOR, C. H. (1946.) **A study of nutritional and biochemical effects in sheep of infestation with** *Trichostrongylus colubriformis*. —*J. Coun. sci. industr. Res. Aust.* **19.** 46–60. **101**

II. CARTER, H. B., FRANKLIN, M. C., & GORDON, H. McL. (1946.) **The effect on wool production of a mild infestation with** *Trichostrongylus colubriformis* **in sheep.**—*Ibid.* **19.** 61–64. **102**

I. Digestibility and mineral balance studies were carried out on young sheep which were given infestations with *T. colubriformis* by administration of infective larvae in daily doses of 1,500–4,500 for a period of 87 days until a total of 200,000 had been received. The resulting infestations were of moderate intensity and none of the sheep showed clinical symptoms of trichostrongylosis. There was no diarrhoea. Maximum faecal egg counts ranged from 1,770–7,440 eggs per gramme in the four infested sheep, and the total daily egg output figures showed maxima of 396,000–2,291,800.

Worm-free controls were included and their food intake was kept at the same level as that of the infested sheep. The sub-clinical infestations which were established resulted in reduced live-weight gains, depression in protein digestibility and poorer utilization of calcium and phosphorus. Blood analyses indicated that decreased retention of calcium and phosphorus occurred in the infested sheep. The serum inorganic phosphorus was first affected.

Data from other observations on infested sheep are included and support the findings on mineral metabolism recorded in the trial.

II. Observations on wool production by the sheep in the metabolism trial discussed in the preceding abstract showed that there was a significant decline in infested sheep. Although the degrees of infestation established were of a moderate, sub-clinical nature, wool production measured by periodical clippings of tattooed areas dropped to 40% of that in the worm-free controls. Food intake was maintained at the same level in the infested and the control sheep.

The ration used consisted of wheaten chaff 100, oats 40, meat meal 10, lucerne meal 37·5 and sodium chloride 1·5 parts by weight, and the mean daily food intake was usually 700 grammes per head. The decline in wool production was greater than might have been expected from the lower digestibility of protein recorded. This emphasizes the value of direct determinations of wool growth in supplementing the usual analyses carried out in biochemical studies with sheep.

No explanation is offered for the mechanism whereby trichostrongylosis interferes with wool growth.—H. McL. GORDON.

DOLL, E. R., & HULL, F. E. (1946.) **Survival of nematode parasites of sheep on pasture during summer.**—*Bull. Ky. agric. Exp. Sta.* No. 482. pp. 4. **103**

Two small plots of permanent pasture were infected by sprinkling with the faeces of infected sheep. The first plot was contaminated during the first two weeks in June; the second during the last two weeks in June. From October parasite-free lambs were allowed to graze on the plots for two weeks. They were removed to a bedded pen for three weeks, then they were killed and examined for parasites.

Apart from two tapeworms the only parasites recovered from the lambs grazing on the plot with three and a half months' exposure to the weather were two *Nematodirus filicollis*. From lambs grazing on the plot with three months' exposure six *Nematodirus filicollis*, 17 *Ostertagia circumcincta* and four *Haemonchus contortus* were recovered. Cultures of the faeces used to infect the pastures showed 50% *H. contortus*, 30% *Strongyloides papillosus* and 20% of other species.

Thus three and a half months of exposure before grazing is sufficient to destroy all nematode parasites except small numbers of *N. filicollis* while three months' exposure eliminates all but three species mentioned. In view of the composition of the faecal cultures, this represents a marked reduction in the number of larvae on the pasture. The authors conclude that pasture rotation coupled with the use of an anthelminthic would be sufficient to prevent the development of a heavy infestation.—R. P. HILL.

GROSSO, A. M., PRIETO, C., & STROBINO, L. E. (1944.) Singamosis. [*Syngamus* **infestation in the Zoological Gardens, Buenos Aires.**]—*Gac. vet., B. Aires.* **6.** 130–133. **104**

The authors report the occurrence of *Syngamus trachea* in various birds in the Buenos Aires Zoological Garden. In small birds, such as cardinals, the infestation proves rapidly fatal, but in larger birds the slower development of the parasite aids treatment.—MILLER WATSON.

CASSAMAGNAGHI (HIJO), A. (1946.) La oesofagostomosis suina. Dos especies reconocidas en los cerdos del pais. Su importancia económica. **[Oesophagostomiasis in pigs. Two species identified in Uruguay.]**—*Bol. mens. Direcc. Ganad., Montevideo.* **29.** 429–442. **105**

The detection in Uruguay of two species of oesophagostomes of pigs is recorded ; *O. dentatum* and *O. longicaudum*. A review of the literature is given on the development cycle, economic importance, and the control and treatment of these helminths.—U. F. RICHARDSON.

GAASE, A. (1944.) Ueber die Verwendbarkeit der Komplementbindungsreaktion zum Nachweis der Trichinose. **[On the value of complement-fixation reaction for the diagnosis of trichiniasis.]**—*Münch. med. Wschr.* **91.** 440–441. **106**

An account is given of complement fixation tests, using Trichinella antigen, on 110 clinical cases of trichinosis following consumption of infected sausage. Of these, 82 gave a positive reaction and of the remaining 28 cases 17 were tested on one occasion only. The infection is described as low-grade. Three cases gave a positive complement-fixation reaction on the second day of illness. At the seventh day of illness 13 cases had been identified. The first strong positive was obtained on the fourth day. The strength of the reaction did not appear to be related to the severity of the illness, but there was a relationship between the grade of haemolysis in the complement fixation test and the degree of eosinophilia. The results of the complement fixation test for diagnosis of trichinella are encouraging. The test may have a practical application in diagnosis of the disease in pigs.

—S. BRIAN KENDALL.

FRANKS, M. B. (1946.) **Specific soluble antigen in the blood of filarial patients.**—*J. Parasit.* **32.** 400–406. **107**

Antigens prepared from *Dirofilaria immitis*, originally used by TALIAFERRO & HOFFMAN (1930), have been found by several workers to give irregular results when used for skin tests in the diagnosis of *Filaria bancrofti*. FRANKS *et al.* (1946) noted that the sensitivity of the skin to test antigens made from the larvae and adults of *D. immitis* is affected by the clinical phase of the infection, especially the degree of microfilaraemia. In this paper, F. attempts to explain these irregularities as caused by the presence of circulating antigens from the parasite. Further, he demonstrates that the power of serum from infected persons to confer a passive skin sensitivity against larval and adult worm antigen was reduced by absorption of the serum with the homologous antigen, thus indicating that there are two separate antibodies involved and that the presence of either antigen causes desensitization. An unsuccessful attempt was made to absorb the sensitizing property of serum by the serum of patients who had a high degree of microfilaraemia and who were negative to the skin test. However, such serum caused a positive skin reaction when injected into the skin of patients sensitive to worm antigens, indicating that antigens were present. An attempt to show that the power of the serum to provoke the skin reaction varied with the degree of microfilaraemia in its donor is described : F. suggests that use might be made of serum from infected persons or dogs in eliciting a diagnostic skin reaction for *F. bancrofti*.—J. F. A. SPRENT.

WHARTON, D. R. A. (1946.) **Transplantation of adult filarial worms** *Litomosoides carinii*, **in cotton rats.**—*Science.* **104.** 30–31. **108**

Work on filariasis has been handicapped owing to the difficulty of finding suitable experimental animals. The worm *Litomosoides carinii* which occurs in the pleural and pericardial cavities of the cotton rat, *Sigmodon hispidus* in some ways resembles the human filaria and may prove useful experimental material. Some preliminary experiments on the transplantation of adult worms from one rat to another suggest that this is possible only after preliminary treatment of the rats. Success so far has followed the use of splenectomized rats the reticulo-endothelial systems of which have been blocked with Indian ink, or with rats previously subjected to X-irradiation. With ten normal cotton rats an attempt to transplant live adult *L. carinii* from the pleural cavity of an infected rat failed. The pathological findings of filariasis in the cotton-rat show neutrophile infiltrated tumours in the mediastinum. These are attributed to the occurrence in this area of dead filaria.—S. BRIAN KENDALL.

DONALDSON, A. W., & OTTO, G. F. (1946.) **Effects of protein-deficient diets on immunity to a nematode** (*Nippostrongylus muris*) **infection.**—*Amer. J. Hyg.* **44.** 384–400. **109**

In a series of experiments, the procedures and results of which are detailed, the development of *Nippostrongylus muris* in 153 rats on a protein-deficient diet was compared with that of the same nematode in 180 rats on a balanced diet. The composition and principal chemical constituents of the two diets are given in a table and show that the protein-deficient diet entirely lacked animal

protein and contained only 8·8% total protein, as compared with 21·5% total protein, over half of which was animal protein, in the balanced diet. It was found that the rats on the protein-deficient diet could not develop the highly protective immunity from repeated sublethal infections which their litter mates developed without exception on the balanced diet. Rats immunized by repeated infections while on the balanced diet later lost a significant part of this protective immunity when fed the deficient diet for only 36 days. The rats on the deficient diet were, in both circumstances, not without some degree of immunity although they were not of the same "immunological status" as previously uninfected animals. The initial experiments with only single infections showed that many rats on the deficient diet were more susceptible to the primary infections than were those on the balanced diet.

The authors suggest that in hookworm infections in endemic areas there is a similar interference with the development of immunity by dietary deficiencies which would thus account, at least in part, for chronic hookworm disease.

—J. N. Oldham.

Deschiens, R. (1944.) Action comparée de la Tanaisie et de l'Armoise sur les formes larvaires de nématodes parasites et saprophytes. [**The action of Tanacetum and Artemisia on the larvae of parasitic and saprophytic nematodes.**] —*Bull. Soc. Path. exot.* **37.** 149–153. **110**

Extracts of *Tanacetum vulgaris* and *Artemisia vulgaris* have traditionally been used as vermifuges. The efficacy of these was tested by placing various nematode worm larvae in 5 ml. of decoctions of either herb. *T. vulgaris* was found to have a lethal effect in 24–48 hours on the larvae of *Protostrongylus* and *Bunostomum* and to kill a percentage of *Dictyocaulus* larvae. No effect was noted with larvae of *Heterodera* sp. and *Rhabditis* sp.

A. vulgaris had a vermicidal effect on larvae of *Protostrongylus*, *Dictyocaulus* and *Bunostomum* while adults and larvae of certain *Rhabditidae* were unaffected.

Methods of preparation of the extracts are described accompanied by an historical account of their use.—S. Brian Kendall.

Araujo, T. L., & Guimarães, L. M. (1942.) Nota prévia sobre o emprego da água oxigenada no tratamento das helmintoses do cão doméstico. [**Hydrogen peroxide in the treatment of helminth infestations of dogs.**]—*Rev. Fac. Med. vet. S. Paulo.* **2.** 51–52. **111**

The authors report promising results in the treatment of canine helminthiasis with hydrogen peroxide, in 1·5% solution injected slowly per rectum until vomiting occurred.—M. Watson.

Calzada, V., & Szyfres, B. (1945.) Comprobacion de un caso autoctono de dioctofimosis en el Uruguay. [*Dioctophyme renale* **infestation in Uruguay.**]—*Bol. mens. Direcc. Ganad., Montevideo.* **28.** 316–322. **112**

The finding of a specimen of *D. renale* in the faeces of a dog in the Pando district of Uruguay is recorded. Descriptions of the worm and the lesions are given. The presence of the worm in the faeces is ascribed to the invasion of the scrotum, and the formation of a fistula in the scrotal region.—U. F. Richardson.

See also absts. **183** (phenothiazine); **195** (tapeworms treated with lead arsenate); **196** (brilliant green and gentian violet for parasitic gastroenteritis).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Wachtel, H. K. (1946.) **Carcinogenic substances from pituitary glands of cattle.**—*Science.* **103.** 556–557. **113**

Carcinogenic substances have been detected in lipoid extracts of human cancerous tissue and also in extracts of non-cancerous liver. Previous work by Lustig & Wachtel (1939) had demonstrated the presence of a lipoid growth-accelerating hormone in the anterior lobe of the pituitary and led to the search for carcinogenic hormonal factors associated with this gland.

Extracts were prepared from the anterior and posterior lobes of fresh bovine glands and injected into white mice of a known low cancer incidence strain. 26·8% of the 67 mice injected developed malignant tumours, mainly situated at a distance from the site of injection. Carcinomata as well as sarcomata were induced. The tumour developed at an earlier date after the injection of anterior lobe extracts as compared with those developing after injection of posterior lobe extracts. (Average 9·3 months for anterior lobe extracts and 14 months for posterior lobe extracts.)—John G. Campbell.

Stewart, H. L., & Lorenz, E. (1947.) **Histopathology of induced precancerous lesions of the small intestine of mice.**—*J. nat. Cancer Inst.* **7.** 239–268. [Authors' summary copied *verbatim.*] **114**

The early morphologic changes which eventuate in carcinoma of the small intestine in mice treated orally with the carcinogenic hydrocarbons 20-methylcholanthrene and 1,2,5,6-dibenzanthracene are described and discussed.

Grossly, the earliest precancerous lesion detected consisted of a circumscribed area 1 to 4 mm. in diameter, with a central umbilicate depression, surrounded by a slightly elevated, smooth, firm, circular border, which may be single or multiple, widely distributed from the pylorus to the ileocecal junction but is most apt to occur at a point 15 cm. from the pylorus. Segments of small intestine diffusely thickened over an area 3 to 9 cm. showed multicentric precancerous lesions. No polypoid lesions were observed.

Microscopically, the earliest precancerous changes involved several groups of epithelial cells and occurred in the midmucosa and at the base of the glands. The usual cytologic characteristics of malignant neoplasm were observed from the beginning of the earliest changes noted histologically. The neoplastic epithelium progressively infiltrated all coats of the intestinal wall.

The majority of the precancerous lesions and early carcinomas were composed of undifferentiated glandular cells derived from the mucosa. In many of the specimens there were numerous signet-ring cells and Paneth cells also.

Degenerative changes occurred in the collagen and reticulum of the lamina propria and submucosa; but the newly proliferated neoplastic cells and glands developing in the midmucosa and more deeply from the crypts, possessed a healthy, well-stained reticulum from their inception, which persisted in the fully formed carcinoma.

Changes occurred in the smooth muscle cells of the muscularis mucosae and inner circular layer of the muscularis which were not neoplastic, but which were considered secondary to stress and traction of the developing cancer.

Several precancerous lesions were observed developing in relation to the intestinal lymph follicles.

A comparison is made between the intestinal precancerous lesions of man and mouse.

HORNING, E. S. (1947.) **Induction of bronchogenic carcinomas in mice.**—*Lancet.* **253.** 207–209. [Author's summary copied *verbatim.*] **115**

Bronchogenic carcinomas were induced in mice of strains A and C3H from subcutaneous grafts of adult lung tissue impregnated with 20:methylcholanthrene.

In mice of strain C3H the tumour incidence was increased if the lung grafts were impregnated with stilboestrol in addition to the carcinogen.

The pathology of the pulmonary tumours is described, and the action of oestrogens on the bronchial epithelium in lung grafts is discussed.

BRYAN, W. R., RILEY, V. T., & CALNAN, D. (1947.) **Absence of effect of urethane on the latent period of tumors induced with subcutaneous injections of the agent of chicken tumor I.**—*J. nat. Cancer Inst.* **7.** 203–206. [Authors' summary copied *verbatim.*] **116**

In a single statistically controlled experiment involving a total of 48 chickens in the effective dose range, the effect of intraperitoneally administered urethane (ethyl carbamate) on the latent period of tumors induced with subcutaneous injections of the agent of chicken tumor I (Rous sarcoma) was studied. No significant difference was observed between the responses of control and urethane-treated chickens. The ability to react with the agent of chicken tumor I to enhance its activity does not appear to be a property of urethane.

LORENZ, E., & STEWART, H. L. (1947.) **Tumors of the alimentary tract induced in mice by feeding olive-oil emulsions containing carcinogenic hydrocarbons.**—*J. nat. Cancer Inst.* **7.** 227–238. [Authors' summary and conclusions copied *verbatim.*] **117**

Six strains of mice (C57 brown, C57 black, C3H, I, dba, A) and A backcross hybrids of both sexes were given orally, aqueous olive-oil emulsions containing either methylcholanthrene or dibenzanthracene in place of drinking water.

Some mice of all strains, with the exception of strain I, developed precancerous lesions and carcinoma of the small intestine.

While olive-oil emulsion only rarely induced squamous-cell carcinoma of the forestomach, stabilized olive-oil emulsion readily induced this lesion.

Neoplastic lesions observed outside the gastrointestinal tract included fibrosarcoma and hemangio-endothelioma of the mesentery and pulmonary tumors.

Factors governing tumor induction by oral administration of carcinogenic emulsions are discussed.

GLAESSNER, K. (1940–41.) Essai sur l'influence de l'administration de tissu conjontif sur le développement du cancer, chez la souris. (Note préliminaire.) **[The influence of feeding connective tissue on the development of cancer in the mouse.]**—*Bull. Ass. franç. Cancer.* **29.** 188–191. [*Cancer Res.* **6.** 94. (1946), abst. copied *verbatim.* Signed: G. H. H.] **118**

This is a preliminary report of an experiment on the effect of the administration of connective tissue (0·1 gm. powdered beef tendon daily) in the diet of mice subsequently inoculated with Ehrlich carcinoma. (a) Tumor weights 18 days after inoculation were 22 gm. in 44 mice that had been fed the tendon for 25 days, and 29·4 gm. in 42 controls. (b) Tumor weights 14 days after

inoculation were 17·2 gm. in 40 mice that had been fed untreated beef tendon powder for 51 days, 54·0 gm. in 40 mice that had been fed pepsin- and HCl-treated beef tendon powder for 51 days, and 65·2 gm. in 42 controls. (c) Tumor weights 8 days after inoculation were 19·6 gm. in 70 mice that had been fed untreated beef tendon powder for 56 days, and 34·0 gm. in 68 controls. It is concluded that the administration of connective tissue confers some resistance against experimental cancer in mice.

STRONG, L. C. (1947.) **Further observations on the genetic nature of gastric cancer in mice.**—*J. nat. Cancer Inst.* **7.** 305–308. [Author's conclusions copied *verbatim.*] **119**

New observations have strengthened a conclusion arrived at previously that a hereditary disease or a hereditary susceptibility to a disease, gastric cancer in mice, has been induced with chemical means.

A multiplicity of pathologic lesions arising just anterior to the pylorus of the stomach in mice are probably biologically related to each other, all being derived from the same or a similar embryologic defect.

This multiplicity of lesions all arising from the same or a similar biologic defect is probably the resultant of biologic variability of mice brought about by (1) the process of hybridization and (2) the induction of germinal mutations by methylcholanthrene or one of its metabolites.

MCPEAK, E., & WARREN, S. (1947.) **The pathology of gastric carcinoma in mice.**—*J. nat. Cancer Inst.* **7.** 309–311. [Authors' summary copied *verbatim.*] **120**

Comment is made on the rare occurrence of gastric carcinoma in lower animals as contrasted with the high incidence in humans. Special attention is paid to reports on spontaneous occurrence of this lesion in mice. Both gross and microscopic characteristics of gastric lesions found in selected NHO mice injected subcutaneously with methylcholanthrene and similar lesions arising spontaneously in descendants of this strain are described in detail. The problem of diagnosis of these lesions is discussed.

DERINGER, M. K., & DUNN, T. B. (1947.) **Mast-cell neoplasia in mice.**—*J. nat. Cancer Inst.* **7.** 289–298. [Authors' summary copied *verbatim.*] **121**

Gross and microscopic observations of five cases of mast-cell neoplasia occurring in reciprocal F_1 hybrid mice of strains A and L are reported.

Observations on the occurrence of mast cells in single longitudinal sections of the spleen in various inbred strains of mice are recorded. There appears to be a considerable difference in the number of these cells, which was highest in old strain A males.

The possible bearing of these observations on theories regarding the origin and function of the mast cell and the relation of these cells to the process of neoplasia are discussed.

RIECKHOF, W. (1943.) Hat der Thymus Einfluss auf das Wachstum bösartiger Geschwülste? [**Does the thymus affect the growth of malignant tumours?**]—*Zbl. Gynäk.* **67.** 745–749. [Abst. in *Cancer Res.* **5.** 125. (1945), copied *verbatim.* Signed: M. H. P.] **122**

The average tumor weight was less in 20 white rats that had been injected with 2 c.c. thymus-Henning (equivalent to 10 gm. fresh thymus gland) daily for 18 days, starting when transplanted Flexner carcinomas were first palpable, than in 31 control rats not so treated. On the 18th day after the first injection, the difference in average tumor weight between the two groups was 40%. However, some of the treated animals showed larger tumors than did several controls.

IVY, A. C., & COOKE, A. (1947.) **An attempt to produce malignant transformation of gastric ulcers in rabbits; a preliminary report.**—*J. nat. Cancer Inst.* **7.** 345–348. [Authors' summary and conclusions copied *verbatim.*] **123**

The daily oral administration of 15 mg. of 20-methylcholanthrene to rabbits in which a "chronic" gastric ulcer had been produced surgically has not resulted in any detectable change in the ulcer in domestic rabbits in from 3·5 to 5·5 months post-operatively. In similarly treated wild rabbits, formation of epithelial cysts occurred in three of the four animals autopsied after 5 to 13 months.

See also absts. **126** (radioiodo compounds in cancer research); **199** (mammary tumours treated with sex hormones).

DISEASES [NON-INFECTIVE] OF BREEDING STOCK

See also absts. **153** (stilboestrol in anoestrus); **164** (lethal defect in fowls).

DISEASES, GENERAL

LØJE, K. (1945.) Torsio abomasi hos Kvaeget. [**Torsion of the abomasum in cattle.**]—*Maaneds-skr. Dyrlaeger.* **57.** 85–98. **124**

Few papers (many based on one or at most two cases) have been written on this subject and even in modern textbooks it is described as rare.

EMSBO (1943), however, draws attention to the fact that it has not always been recognized in the clinics. On account of its assumed rarity its cure by surgical means had not hitherto been attempted. L. gives an account of two cases successfully treated in this way. He first describes the degrees and possible direction of the torsion.

Its aetiology he considers obscure, EMSBO suggests that a paresis of the abomasum with stenosis of the pylorus is the most likely primary cause but L. observed that in animals with depraved appetite the abomasum, on account of the half empty condition of the stomach, is exceptionally mobile: in such circumstances an attack of diarrhoea with the increased peristalsis that accompanies it could lead to torsion. In one and a half years of practice, L. saw two cases of torsion as compared with ten cases of traumatic indigestion. The symptoms vary much and depend on the degree of torsion and time of investigation. Very acute cases with relatively rapid death are rare. The most typical cases run a slow course, with mainly gastro-enteritic symptoms. Other usual symptoms are sudden onset, with anorexia, stasis in the alimentary canal, cessation of rumination and occasional slight tympanitis on the left side. General condition is poor, with a temperature at first normal but falling later, except where peritonitis supervenes; the pulse is rapid. After a few days' illness there may be melaena. This symptom, with the distension of the abdomen that also takes place after a few days, is very characteristic. The splashing sound, described in the literature and elicited by percussion in the right flank, is not distinctive for this disease: it is the tympanitic note sometimes obtained over the dilated and dislocated abomasum that is characteristic, but this may be masked by a layer of fat. Occasionally the distended abomasum can be palpated through the rectum, but this does not often happen until near the end of the illness.

The differential diagnosis of this condition and other abdominal diseases is discussed. If there is doubt, an explorative laparotomy can be performed with little risk to the patient. L.'s method of doing this is described in detail. Details are also given of the exact procedure to be followed should the condition be confirmed.

—M. E. ROBERTSON.

GRAU, H. (1944.) Schilddrüse und Herztod beim Schwein. (Vorläufige Mitteilung.) [**The thyroid gland and syncope in pigs (preliminary article).**]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* March 17th. 90–92. **125**

The presence of a thyro-toxicosis with profound histological changes in swine dying from heart syncope [first described by DOBBERSTEIN & MATTHIAS—see *V. B.* **17** 482] has been confirmed. It has also been suggested that these thyroid lesions are the primary cause of the animal's death.

G. examined many thyroids from pigs dying from other diseases and from 31 healthy pigs slaughtered for meat. Most of these thyroids had histological changes, which varied in severity, but among all groups of healthy or sick pigs there were also apparently normal thyroids. The presence of the thyroid lesions cannot, therefore, be regarded as characteristic for any particular disease.

What causes the changes in the thyroid itself is not clear, but in most cases of sudden death, lesions are present; it may well be that a shock just prior to death causes a sudden outpouring of colloid into the circulation.—C. AHARONI.

BLOCH, H. S., & RAY, F. E. (1946.) **Organic radioiodo compounds for cancer research.**—*J. nat. Cancer Inst.* **7.** 61–66. [Authors' summary copied *verbatim*.] **126**

The use of radioactive organic compounds which localize the selectivity in tumors is discussed. Possible methods for the diagnosis and treatment of malignant neoplasms, particularly carcinoma of the stomach, are suggested. A variety of radioactive dyes, dye intermediates, and sulfonamides which may show selective localization in tumors, was obtained by incorporating radioiodine into aromatic amines and phenols. Ordinary iodo derivatives of promising compounds were prepared. They served as models for the corresponding radioiodo compounds.

The synthesis of radioiodo derivatives from radioiodine is described. Radioiodo-trypan blue was synthesized from trypan blue by the Sandmeyer reaction. Radioiodosulfanilamide and radioiodosulfapyridine were obtained in good yields with respect to radioiodine by treating an acid aqueous solution of the parent sulfonamide and sodium radioiodide with iodine monochloride.

See also absts. **236** (diseases of poultry); **240** (histomonocytic reticulosis).

NUTRITIONAL AND METABOLIC DISORDERS

HUGGETT, A. ST. G. (1946.) **Some applications of prenatal nutrition to infant development.**—*Brit. med. Bull.* **4.** 196–204. **127**

The diet in the last eight weeks of pregnancy in sheep is very important in controlling the weight and development of the lamb. Animals fed on a high-plane diet of concentrate and excess rations show good mammary development and

have a high milk yield of which the more vigorous lamb can take full advantage. The lambs from mothers fed on a restricted diet not only have a lower weight but also a retarded physiological development, as shown by absence of temperature control and a high mortality in neonatal life. The effects of restricted diet are more pronounced with multiple births. The effect of low diet of the mother affects the tissues of the foetus to a different extent: the nervous system is least affected, bone more so, muscle and flesh most. To explain this HAMMOND (1944) has suggested that the tissues having the highest metabolic rates have a priority of supply of all nutrients over those tissues and parts with a lower metabolic rate.—J. M. ROBSON.

BENNETTS, H. W., HARLEY, R., & EVANS, S. T. (1942.) **Studies on copper deficiency of cattle: the fatal termination ("falling disease").**—*Aust. vet. J.* **18.** 50–63. [Shorter version appeared in *J. Dep. Agric., W. Aust.* (1942.) **19.** 96–104.] **128**

The authors regard this condition, spoken of locally as "falling disease", as the terminal manifestation of copper deficiency. Haematological and pathological findings for fatal and non-fatal cases of copper deficiency are compared.

Seasonal changes leading to a higher plane of nutrition with increased bulk and quality of pasture in the spring are considered to be associated with the sudden deaths, which are attributed to the stresses of intensive milk production.

The authors conclude that the ultimate cause of death is probably due to atrophy and patchy fibrosis of the myocardium.—D. A. TITCHEN.

BENNETTS, H. W., BECK, A. B., HARLEY, R., & EVANS, S. T. (1941.) **"Falling disease" of cattle in the south-west of Western Australia. 2. Studies of copper deficiency in cattle.**—*Aust. vet. J.* **17.** 85–93. [See also *V. B.* **10.** 854.] **129**

Clinical and pathological characteristics of the disease are recorded. Reference is also made to an experimental herd in which there was a response to the administration of pure copper supplements. The authors note that there was an apparent prevention of "falling disease" following the administration of copper supplements, as well as an improvement in health and production in herds so treated.—D. A. TITCHEN.

RIBEIRO, J. M., & JANZ, G. J. (1946.) Novos aspectos do metabolismo da vitamina A. **[Vitamin A metabolism.]**—*Rev. Med. vet., Lisboa.* **41.** 56–64. [English summary.] **130**

Low serum vitamin A values are not uncommon in the horse and this state can be correlated with skin affections and infertility. It appears that the horse is slow to convert carotene into vitamin A, and that any variation from the normal vitamin A/carotene ratio is as significant of deficiency as an actual fall in vitamin A content. Administration of preformed vitamin A will relieve the symptoms of deficiency.—I. W. J.

PEIRCE, A. W. (1946.) **Changes in the concentrations of carotene and of vitamin A in the blood of sheep grazing on natural pastures in South Australia.**—*Aust. J. exp. Biol. med. Sci.* **24.** 231–240. **131**

Monthly determinations of plasma vitamin A of sheep grazing at the Waite Institute, Adelaide, revealed no significant difference between mean concentrations (25–35 γ per 100 ml.) during consecutive summer and winter periods despite variations of the order of two thousand-fold in the intakes of carotene (1 mg. while grazing on dry pasture in the autumn, to 2 g. per day while grazing on green pasture in the spring). A slight but significant increase in the concentration of plasma vitamin A occurred throughout the course of the observations.

The carotene in the plasma, although low at all times, tended to be influenced by the intake of carotene. Measurable quantities (5–16 γ per 100 ml.) were present when green grass became available.

At Yudnapinna Station (50 miles N.E. of Port Augusta) the concentration of vitamin A in the plasma was found to lie within the normal limits, except at the end of a period of two years in which the rainfall was below normal. At this time the concentration had fallen to about two-thirds of the normal value. The sheep maintained their body weight throughout the period of the observations.

In all sheep examined at various stages of the experiment, the reserves of vitamin A in the liver were found to be adequate, ranging from 230–810 γ per g. liver. Carotene was present to the extent of only 2–5 γ per g. liver.—C. S. SAPSFORD.

BONFANTE, G. (1945.) Disturbi locomotori nei volatili da cortile in dipendenza di ipovitaminosi A. **[Locomotor disturbances in fowls with vitamin A deficiency.]**—*Clin. vet., Milano.* **68.** 106–108. **132**

Sporadic cases of locomotor disturbances in birds kept in a confined space and on a poor diet were attributed to lack of vitamin A, since eggs laid by such birds had low provitamin A content. Furthermore, the administration of a preparation rich in vitamin A led to a complete cure of the symptoms in 10–12 days. The disturbances in question ranged from a simple ataxia to lameness or partial or complete paralysis of both limbs, with medial deviation of the toes.—I. W. J.

Spisni, D. (1945.) La vitamina C nei ruminanti. **[Vitamin C in ruminants.]**—*Clin. vet., Milano.* **68.** 73–77. **133**

Three cattle on a diet consisting mainly of dry food, were injected intrajugularly with large doses of ascorbic acid. There followed an increase in the quantity of milk, and in the total amount of vitamin C in that milk. (The actual percentage of vitamin C in unit volume remained more or less unaltered.) When the experiment was repeated on four cows on a diet of green food and giving a high milk yield, there followed no marked alteration either in the quantity or quality of the milk.

If the results can be confirmed in larger groups of animals it will point to lack of vitamin C, or of its synthesizing agent in dried food, being responsible for low milk yield in winter.—I. W. J.

Vittone, R. (1946.) La miodegenerazione cerea, o degenerazione di Zenker, da ipoavitaminosi C dei vitelli. **[Waxy muscle degeneration (Zenker's degeneration) produced by vitamin C deficiency in calves.]**—*Clin. vet., Milano.* **69.** 65–80. **134**

Cases of idiopathic muscle degeneration in calves appear to be a manifestation of scurvy, since they respond to vitamin C therapy. Many calves up to the age of about four months have no ability to synthesize vitamin C and must obtain their requirements either artificially by parenteral injection, or *via* the mother's milk. Naturally occurring cases of scurvy arise as a result of climatic factors affecting the quality of the pasturage, and causing a deficiency of the vitamin in the maternal milk.—I. W. Jennings.

Anon. (1946.) **Biotin deficiency in pigs.**—*J. Amer. vet. med. Ass.* **109.** 219–220. **135**

A biotin deficiency was produced in pigs fed a synthetic ration which contained 30% desiccated egg white, sucrose, lard, vitamins and minerals. The symptoms began to appear in less than three weeks. Hair was lost from the posterior aspect of the thighs, and the alopecia proceeded over the back and sides of the body. The remaining hair was found to be loosely attached. Skin changes developed characterized by dryness, roughness and a brownish exudate. After about five weeks, the feet had cracks and the hind legs became spastic. The syndrome was prevented in controls by daily intramuscular injections of 100 mg. of crystalline biotin per pig. The experiment was conducted on a paired-feeding basis. The feed consumption of the deficient pigs per lb. of gain was increased by 50%, while the daily rate of gain was reduced by 45%. The findings of the experimental biotin deficiency produced by feeding egg white may be of practical importance when eggs unfit for human food are fed to pigs. Chicks, when fed a ration deficient in biotin, also often develop haemorrhagic cracks and incrustation on the under surfaces of the feet.—E. Kodicek.

Ellinger, P., & Shattock, F. M. (1946.) **Nicotinamide deficiency after oral administration of penicillin.**—*Brit. med. J.* Oct. 26th. 611–613. **136**

A case of nicotinamide deficiency after oral administration of 15 penicillin tablets of 500 units each has been described. The patient complained of lassitude, of inability to concentrate on mental work and of subjective sensory changes in both legs. The skin of the fore-arms and back of the hands was dry, coarse, and inelastic. The tongue had a dark slaty colour. All the symptoms disappeared on treatment for three days with 600 mg. nicotinic acid. The nicotinamide methochloride excretion decreased during the penicillin treatment from 2·3–1·13 mg. daily. When penicillin was discontinued, the excretion of nicotinamide methochloride rose immediately to 2·6 mg. per day. The deficiency signs could be developed repeatedly in the same subject by administration of penicillin.—E. Kodicek.

McDonald, I. W. (1946.) **Studies on the etiology of "phalaris staggers" in sheep: a preliminary report.**—*Aust. vet. J.* **22.** 91–94. **137**

"Phalaris staggers" is a disease of sheep and cattle characterized by nervous symptoms and degenerative changes in the central nervous system, and is associated with the consumption of the perennial "*Phalaris tuberosa*".

Twelve field experiments were planned to test the hypothesis that the disease is due to a soil-deficiency which is responsible for an abnormal metabolism of the plant and that this resulted in the production of a toxic substance or in the excessive production of some normally non-toxic substance.

The experiment was based on the grazing of pastures top-dressed with the micro-nutrients boron, manganese, zinc, copper and molybdenum. For this purpose farms where the disease was known to occur and areas of pasture where phalaris was dominant were selected.

From the results it was concluded that the disease is prevented by such top-dressing but the active element (or elements) in the mixture has yet to be determined.—N. Wickham.

Boddie, G. F. (1946.) **Diet and dental health. Chronic fluorine intoxication in sheep and its effect upon the teeth.**—*Proc. Nutr. Soc.* **3.** 94–97. **138**

After a brief review of the literature on chronic fluorine poisoning, due both to natural and industrial conditions, B. reports on an out-

break of chronic F intoxication in sheep in the neighbourhood of an aluminium factory. 62% of the adult sheep were affected although the lambs were free from trouble. None of the sheep was lame, but dental lesions were marked and included mottling of the enamel of the permanent incisors accompanied by deformations or such a brittleness that they readily broke off or wore down rapidly to gum level. There was further a characteristic poor wearing quality of the cheek teeth, leading to selective abrasion and deformity and resulted in long points which impinged on the gum of the opposite jaw causing ulceration and leading to infection. In this irregular state of the dentition the chewing of the food was adversely affected. The entrance of infection led to alveolar periostitis and suppuration of the roots of the cheek teeth, producing a chronic purulent nasal discharge through the sinuses of the skull. In some cases there was evidence of osteoporosis.

On chemical analysis of the teeth the F content was 0·25–0·80% (normal 0·15–0·19%) and there was a marked elevation of the F content of the jaw bones. The herbage contained 61 p.p.m. F compared with 44 p.p.m. on a neighbouring farm where the soil also contained 51 p.p.m. Running water from a stream on the holding contained only 0·1 p.p.m. F.

Further clinical effects were the extreme debility of the sheep and their inability to withstand severe weather. Lambs were born weakly and most ewes had little or no milk. In these cases of chronic F poisoning it was especially noticed that there was neither clinical nor P.M. evidence of any contributory cause to the debility, the low helminth infestation being noteworthy.

There appears to be no known antidote to F poisoning and the remedy consists of preventing contamination from the industrial source.—A. E.

I. Campbell, A. M. G., Daniel, P., Porter, R. J., Russell, W. R., Smith, H. V., & Innes, J. R. M. (1947.) **Disease of the nervous system occurring among research workers on swayback in lambs.**—*Brain.* **70.** 50–58. **139**

II. Anon. (1947.) **On the track of disseminated sclerosis.**—*Brit. Med. J.* Sept. 20th. 1947. 460. **140**

I. Four out of a group of seven research workers who investigated the demyelinating disease in lambs known as sway-back over a period of several years developed disorders of the central nervous system stated to be clinically indistinguishable from disseminated sclerosis. It is therefore suggested that there may be some causal connection between swayback and disseminated sclerosis and a speculative discussion is given along these lines, *viz*, to some common infective agent acting only in the presence of a trace element deficiency.

So far, copper therapy in the affected workers has been without effect.

II. An annotation on I. above. It is pointed out that some neurologists postulate that two factors are responsible for disseminated sclerosis, one inborn and the other acquired but their nature remains obscure. Since over half the research workers referred to in I. have been affected with disseminated sclerosis it is suggested that the disorder is related to a common environmental factor experienced by them all, hence their common interest in swayback is incriminated.

Innes, J. R. M., & Shearer, G. D. [see *V. B.* **6.** 30] showed that swayback resembles Schilder's encephalopathy in its gross pathological appearance and is not like disseminated sclerosis.

Since swayback in the lamb is due to a low copper status of the ewe during pregnancy which in Great Britain is not due to a deficiency of copper in the pastures as it is in Australia and New Zealand, it is now suggested that a deficiency of a trace metal in the mother may predispose the subject to exposure to some other agent in life, which in turn may give rise to the perivascular demyelination which occurs in disseminated sclerosis. Although the administration of copper to the cases of disseminated sclerosis has been without benefit it is suggested that perhaps the search for the cause of this disease has begun to narrow down. [No account has been taken of other groups of research workers on swayback who have been investigating the disorder over a number of years and who have not developed disseminated sclerosis.]—R. Allcroft.

*Tabusso, M. E. (1942.) Paraplegia enzoótica de los corderos. Renguera peruana. **[Enzootic paraplegia of lambs—Peruvian *renguera*.]**—*Publ. Inst. nacion. Biol. Animal, Lima.* **1.** 1–38. [Abst. from abst. in *Biol. Abstr.* Sect. F. **17.** No. 2. 30.] **141**

Peruvian *renguera* is a form of paralysis of prenatal origin, found in sheep and alpacas in Peru, which attacks animals from birth up to 1–2 months of age. It is characterized by ataxia of the hind quarters and, occasionally, of the forequarters, which may extend to a complete paralysis. The lesions are found in the central nervous system, the primary lesion being in the brain and secondary lesions in the spinal cord. In severe outbreaks there are many cases of abortion, and lambs are born dead or severely affected. Peruvian *renguera* is similar to and probably identical with the diseases of the same type well known in Australia (ataxia of lambs), in England (swayback or swingback) and in Sweden (*Paralysis der Lämmer*). In Peru it has existed for 30 years in an enzootic form, especially in the high altitudes (3,500–4,500 m.) along the western Andes. The

disease appears periodically with a peak approximately every 7–10 years. During the height of the disease, the percentage of animals attacked reaches 50–70 with a mortality of 90% of the animals affected. When the disease occurs in a severe epizootic form, chronic cases, in which the affected lambs may live and develop normally, are rare. When the epizootic decreases, only chronic cases occur and the frequency may subside to a minimum of 1–2%.

Peruvian *renguera* is not caused by any demonstrable pathogenic bacterium. J. F. Mitchell claims to have transmitted *renguera* experimentally into susceptible animals. It has been suggested that it is an intoxication caused by fumes (Pb and As) from a mineral smelter or a deficiency disease. The lesion characteristic of *renguera* does not consist of the primary degeneration of the spinal cord, as was once supposed, but of a brain lesion consisting of a degeneraton of the white matter. This lesion is of foetal origin, probably due to deficiency of some factor. The results obtained in Peru with a supplementary diet of Cu, and those obtained in other countries (Australia and England), seem to indicate a deficiency of organic Cu. Investigations are in progress to determine whether Cu deficiency alone causes *renguera*, or whether some other factor, such as a deficiency or an infective agent (virus) is concerned. Investigation is also being carried out to determine if the lesions of the white nervous matter found in renguera corresponds histopathologically with the demyelinization described in swayback. Renguera is not due to chemical intoxication such as the fumes from a mineral smelter. [The relationship of *renguera* to swayback is discussed by Russell, F. C. See *V. B.* **16.** 111.]—R. Macgregor.

See also absts. **223** (determination of cobalt) ; **237** (animal nutrition).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Davies, D. V. (1946.) **Synovial membrane and synovial fluid of joints.**—*Lancet.* **251.** 815–819. **142**

D. gives an account of the development and structure of the synovial membrane of a joint, and refers to the presence of elastic laminae particularly in mobile areas.

Nerves pervade all layers of the membrane as is evidenced by its sensitivity to pain. Blood capillaries are numerous and communicate freely with the periosteal and epiphysial supply, a fact of importance when considering nutrition of the avascular articular cartilage.

The volume of synovial fluid bears little relation to the size or capacity of the joint in question, and the suggestion is advanced that although it serves to lubricate the joint surfaces this may not be the main function ; in this connexion D. focuses attention on the chemical and cellular content of synovial fluid. Theories of the origin of synovial fluid are discussed.

—C. W. Ottaway.

Cowie, A. T., & Folley, S. J. (1947.) **The measurement of lactational performance in the rat in studies of the endocrine control of lactation.**—*J. Endocrinol.* **5.** 9–13. **143**

The mean growth of the litters of a group of lactating rats was closely fitted by a logistic equation over the whole period during which the young are solely dependent on their mother's milk, The " litter-growth index " for a group of rats is defined as the mean daily gain in weight per litter over the five-day period from the 6th to the 11th days. The use of this quantity as an approximate measure of lactational performance enables the effect of endocrine factors on lactation to be studied quantitatively.—J. M. Robson.

—. (1946.) **Discussion on the life and death of the red blood corpuscles.** [Speakers : Callender, S. T., Loutit, J. F., & Jope, E. M.]—*Proc. R. Soc. Med.* **39.** 755–762. **144**

The life of red cells has been investigated by the Ashby technique, by the process of bleeding and immediate transfusion of healthy volunteers. The results show that the life of transfused red cells in the normal subject is about 120 days in both males and females. There is presumptive evidence that the life of any individual's own red cells, apart from the effects of haemolysis or blood loss, is 120 days, and that the main factor determining the disappearance of any cell is its age.

Cells from normal subjects transfused to patients with hypochromic anaemia and treated pernicious anaemia have a normal life span. On the other hand, cells from an untreated patient with pernicious anaemia were transfused into another subject and were much more rapidly destroyed, suggesting that the red cells in pernicious anaemia are discharged from the marrow with faulty protoplasm. The findings in congenital acholuric jaundice suggest that the red cells are abnormal due to an inborn defect ; in acquired acholuric jaundice there is a circulating haemolysin.

Sulphaemoglobin (SHb) persists in circulating blood for many weeks. It appears, therefore, that the red cell has no means within it of transforming SHb, and hence that the body can have no means of removing SHb other than by destruction of the

red cells that contain it. This method can, therefore, be used for determining the life of red cells and the results agree with other recent methods in showing that the life span is about 120 days. —J. M. Robson.

Lombard, C., & Benoit, J. (1945.) Leucémie de la jument à adénopathies localisées. [**Leucaemia with local adenopathy in the mare.**]—*Rev. Méd. vét., Lyon et Toulouse.* **96.** 145–148. **145**

The authors describe lesions seen in a mare which had been killed for dissection. The gastro-intestinal and the mediastinal lymph nodes were affected. They were enlarged, congested, and showed areas of necrosis. The carcass lymphatic nodes were not affected. Blood examinations were not carried out and the histology of the lesions is not well described.—A. R. Jennings.

Näätänen, E. (1946.) **The effect of methylene blue on the cells of the central nervous system.** —*Acta path. microbiol. scand.* **22.** 603–614. [In English.] **146**

N. found severe degenerative changes in nerve cells of test animals comprising nine rats, three very young rabbits and one g. pig, after subcutaneous injection of methylene blue solution even in very small doses, degeneration being found in all parts of the central nervous system, especially in the cerebral cortex. In view of the popularity of methylene blue as a therapeutic agent, especially in human carbon monoxide poisoning, he considers these findings to be of considerable importance and suggests that this drug be used very cautiously.—L. M. Markson.

Blom, E. (1945.) **Spontaneous detachment of the galea capitis in spermia of bull and stallion.** —*Skand. VetTidskr.* **35.** 779–789. [In English.] **147**

Photomicrographs of indian ink preparations show various stages in the detachment of the galea capitis (acrosome) of bull sperms. This detachment was most often seen (up to 18% of total sperm heads) in the semen of bulls after a period of sexual inactivity, while it was almost or quite absent in bulls in regular use. The detachment appears as the first detectable regressive change resulting from a prolonged stay in the epididymis.

Numerous detached galea were seen in an ejaculate from a 12-years-old thoroughbred stallion which had never copulated. It is suggested that the routine examination of bull semen should include an estimation of the degree to which galea detachment is present, and that bulls in which it is high, and fails to decrease considerably after repeated ejaculations, are unsuitable as donors for artificial insemination purposes.—E. Cotchin.

Calisti, V. (1946.) Sul punto isoelettrico delle mucine dell'apparato sessuale delle bovine. [**Iso-electric point of the mucins of the bovine genital organs.**]—*Clin. vet., Milano.* **69.** 97–105. **148**

Samples of mucus from the genital organs of pregnant cattle, tested at various stages of pregnancy, had an average pH of approximately 4·0. Immediately before parturition, the pH dropped to approximately 3·0. The pH of mucus from the genitalia of animals in heat was not tested.—I. W. J.

Fan, P. C. (1943.) [**Genetics and breeding of the fowl.**]—*Chin. J. Anim. Indust.* **1.** 278–289. **149**

This is a review of the literature on genetics and breeding of the fowl.—S. J. Chu.

Lindtner, M. (1946.) Studio comparativo sull' eliminazione del bromo per gli escrementi nel gallo e nella gallina, a proposito della differente azione dell'alogeno sulle ghiandole genitali dei due sessi. [**Comparison of bromine excretion in the cock and hen, with regard to the differing action of the halogen on the genital glands in the two sexes.**]—*Clin. vet., Milano.* **69.** 81–84. **150**

By injecting three cocks and three hens subcutaneously with sodium bromide, and collecting and analysing the renal-intestinal excretions, L. was able to show that the male birds excreted more bromine than did the females. The difference was accounted for by the excretion of bromine in the eggs of the females. This extra mode of elimination in the female may account for the difference in the action of bromine on the gonads of the two sexes.—I. W. Jennings.

Sachweh, P. (1943.) Weitere Beobachtungen am Hypophysen-Vorderlappenhormon im Serum tragender Stuten. [**Anterior pituitary hormone in the serum of pregnant mares.**]—*Tierärztl. Rdsch.* **49.** 1–4. **151**

Experiments are described which indicate that the gonadotropin in pregnant mares' serum is highly resistant to putrefactive changes in the blood and remains active in serum which is several months old. If haemolysis occurs and the serum proves toxic to test animals, the gonadotropin can be precipitated out from the serum by alcohol and dissolved in water. To test for gonadotropin, S. uses two or three mice and gives one injection only, the dose varying from 0·5–1·0 ml. serum. The mice are killed and their ovaries examined four days later.

S. stresses that clinical diagnosis of pregnancy is of primary importance and that serum-gonadotropin tests should only be regarded as an aid to diagnosis.

[In view of the findings of Cole & Goss—see *V. B.* **17.** 336—it is clearly incorrect to designate

the gonadotropin in pregnant mares' serum as " anterior-pituitary hormone ".]—A. T. Cowie.

Day, F. T., & Rowlands, I. W. (1947.) **Serum gonadotrophin in Welsh and Shetland ponies.** —*J. Endocrinol.* **5.** 1–8. **152**

Observations were made on the gonadotropic potency of serum from 75 Welsh ponies bled in Wales in 1940 and from 13 Shetland ponies in Cambridge during successive pregnancies between 1940-44.

In 1940 the average potency of the serum from Welsh ponies between the 45th and 100th days of pregnancy was 133 i.u. per ml., while that from Shetland ponies was 258 i.u. per ml. The concentration of the hormone in the Shetland ponies decreased in succeeding pregnancies so that by 1944 the mean potency was only 40 i.u. per ml. Stilboestrol excretes a powerful abortifacient action in the mare.—J. M. Robson.

Kieliger, F. (1946.) Einige Erfahrungen mit Stilboestrol vet. " Roche ". **[Experiences with stilboestrol vet.]**—*Schweiz. Arch. Tierheilk.* **88.** 455–458. **153**

K. points out that, the nonesterified stilbene preparations act more quickly and strongly than the esterified. After the use of both natural extracts and the synthetic oestrogens in cases of anoestrus, ovarian cysts often occur. According to K. the non-esterified oestrogens are more suitable for therapy than the esters; these, injected in an oily solution, act weakly, but for a longer period, making overdosage more liable. Zollinger [see *V. B.* **17.** 436] used stilboestrol vet. " Roche " [a non-esterified diethyl stilboestrol] for treatment of persistent follicles in cows, with good results.

Chief indication for the use of follicle hormone is anoestrus (anaphrodisia). It may also be used for evacuation of pathological contents from the uterus. K. treated about 100 anoestrous heifers with doses (one usually sufficed) of 5–10 ml. stilboestrol vet. " Roche " without any sign of nymphomania. In 64 treated cases the results were as follows:– after treatment, 55 animals (85%) were in heat; 54 of them were served and 31 (57·4%) became pregnant. Signs of heat were usually noticed 1–3 days after injection. The figure of 57·4% for the animals which came into calf is considered satisfactory.

Of eight virgin heifers in which cysts were found, four came into calf after further treatment. In seven cases of pyometra or dead foetus *in utero* prompt evacuation of the uterus was obtained, after the administration of 5–10 ml. stilboestrol vet. One animal eight months pregnant was mistakenly treated with 10 ml. stilboestrol, but calved normally at the right time.

Results in pigs were not clear. In 50% of treated pigs signs of heat could be produced. K. assumes that a combination of vitamin E. with stilboestrol may be most satisfactory in pigs.
—P. Sasse.

—. (1947.) **The spleen as an endocrine gland.** *Brit. med. J.* April 5th. 458–459. **154**

Splenin is a substance produced by the spleen which reduces the bleeding time, increases capillary resistance and inhibits the release of histamine from blood cells. It has been isolated as a crystalline solid of low molecular weight and melting point, active in doses as low as 3×10^{-7} mg. per kg. Trauma probably leads to the release of renin by a mechanism involving the pituitary and the adrenal cortex. There is evidence that splenin plays a part in the antitrypsin activity of serum.—J. M. Robson.

*del Castillo, E. B. (1943.) El bacilo de Koch en las endocrinopatias. **[Tubercle bacillus and endocrine diseases.]**—*Rev. Asoc. méd. argent.* [No. 523.] 1069. Abst. in *Amer. Rev. Tuberc.* **52.** No. 3. p. 62 of absts. (1945). [Author's summary copied *verbatim*. Signed: W. S. Swienty.] **155**

An analogy is drawn between bacteriology and endocrinology. After the discoveries of Koch and Pasteur opened a new field of science, bacteriology, we see to-day a rapid succession of new discoveries in endocrinology. The results are often surprising. The pathology of the suprarenal glands is linked to the lesions produced by the tubercle bacillus. Of the first 11 cases published by Addison in his famous monograph, 5 had bilateral and one had one-sided tuberculosis of the adrenals. Tuberculosis of the adrenals causes a clinically well defined syndrome. Also of importance in endocrinology is tuberculosis of the ovaries and the adnexa. Tuberculous lesions in other endocrine glands play a rôle only in individual cases.

Brunaud, M., & Pitre, J. (1945.) Existe-t-il de l'adrénaline dans la sueur du cheval? **[Adrenalin in the sweat of horses?]**—*Bull. Acad. vét. Fr.* **18.** 339–347. **156**

In the sweat of horses a substance is present possessing sympathomimetic actions when tested on isolated rat intestine and on the blood pressure of anaesthetized cats. This substance like adrenalin gives the Viale colour test. Assays of sweat indicate an equivalent of 5·0–7·5 mg. adrenalin per l. The substance appears to be more stable than adrenalin. The stability is considered to be due to the action of the sweat in protecting the active substance from oxidation.—A. T. C.

Schaeffer, G., & Thibault, O. (1945.) Recherches sur les facteurs hormonaux de la

régulation thermique. Effets de l'adrénaline sur les échanges en fonction de l'activité thyroidienne. [**Hormones and heat regulation; effects of adrenaline on thyroid activity.**]—*C. R. Soc. Biol. Paris.* **139.** 855–856. **157**

Adrenalin increased metabolism by 53% in normal rats, by 8% in thyroidectomized rats, and by normal amount again in thyroidectomized rats fed on thyroid powder. The mechanism of this phenomenon is unknown.—J. M. Robson.

Carpenter, R. K., Macleaod, L. D., & Reiss, M. (1946.) **The effect of adreno-corticotrophic hormone on the respiratory metabolism of the adrenal cortex of the rat.**—*J. Physiol.* **105.** 231–235. **158**

Twenty-four hours after injection with 50–100 units of corticotrophic hormone, the adrenal cortex of rats showed a rate of oxygen uptake about 25% higher than that of normal rats. Aerobic glycolysis was variable in treated and control animals. The nitrogen content of the dry substance of the adrenals tended to rise after treatment.—J. M. Robson.

Chu, J. P. (1945.) **The influence of the thyroid on pregnancy and parturition in the rabbit.**—*J. Endocrinol.* **4.** 109–114. **159**

Thyroidectomy in the rabbit at an early stage of pregnancy caused resorption and abortion; operation at a later stage resulted in delivery of still-born young. When pregnancy was induced in thyroidectomized rabbits, there was either resorption, or abortion, or prolongation of gestation. The new-born foetuses of the thyroidectomized animals were usually dead. Thyroidectomized rabbits were fed on desiccated thyroid and mated; two out of four animals produced normal viable litters.—J. M. Robson.

Dewar, A. D., Hall, K., & Newton, W. H. (1946.) **Potentiation of the vaginal response to oestrone by the "relaxin" fraction of pregnant rabbit serum.**—*J. Physiol.* **105.** 37*P*–38*P*. O.a.g. **160**

Relaxin (obtained from the serum of pregnant rabbit) has no oestrogenic effects, but increases the intensity and duration of the oestrogenic action of oestrone on the vagina of ovariectomized mice. Slight potentiation was produced by an extract of non-pregnant rabbit serum.—J. M. R.

*Benedek, R. (1942.) [**The hormone content of the allanto-chorion "fragments" (Hippomanes).**]—*Inaug. Diss., Budapest.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* February 4th. 48. (1944).] **161**

There is a popular belief in South Hungary that by feeding hippomanes to newly calved cows the milk yield can be increased. The possibility that hippomanes might contain lactogenic hormones was investigated. Positive Allen-Doisy tests for oestrogens were obtained with hippomanes from 26 mares, but Aschheim-Zondek tests for gonadotropins were negative. Tests for prolactin were made by the Riddle pigeon-crop technique; two pigeons gave negative reactions, 19 weak positive and nine strong positive. It was concluded that hippomanes are rich in oestrogens and contain a moderate amount of prolactin but no gonadotropin. [See also Cole & Goss—*V. B.* **17.** 336.]—A. T. Cowie.

Slijper, E. J. (1946.) **Comparative biologic-anatomical investigations on the vertebral column and spinal musculature of mammals.**—*Kon. Ned. Akad. Wet., Verh.* (*Tweede Sectie*). **42.** No. 5. pp. 1–128. [In English.] **162**

An attempt was made to find the factors responsible for the spinal anatomy of mammals and for the differences in structure between various types of mammals. Some 80 species are included in a structural and functional study of direct veterinary as well as comparative zoological interest. Ungulates and Carnivora, including horse, cow, and dog, are dealt with in some detail and the locomotion of the horse in a gallop is contrasted with the leaping gallop of other animals.

The anatomy of the vertebrae, ligaments, and muscles is described and much of the work, especially on the epaxial musculature is original. A microscopic study of the insertion of tendon fibres is also described and illustrated.

Considerations are put forward for abandoning the comparison of the body-axis (vertebral column and spinal musculature) of mammals either to an arched roof or a bridge. Instead, the author suggests the analogy of an elastic bow (pelvis and body-axis of trunk) bent in the dorsal direction (ventral concave) by a string (sternum, abdominal muscles, linea alba, extrinsic muscles of the legs). The head and neck may be compared to a loaded beam supported at one end only. The principal static function of the body-axis is to resist bending in the dorsal direction. The elastic resistance is caused by the strength of the intervertebral discs and ligaments but chiefly by the tonus of the epaxial musculature.

The moment of resistance against bending of all the vertebrae is determined and plotted out in a curve. This diagram is not a straight line, the stress of the body-axis depending also on the relative development of the additional supporting elements.

The epaxial musculature has chiefly to prevent or to exercise movements in the sagittal direction. Specializations have occurred in the evolution of the Ungulata when the leaping-

gallop was replaced by the horse-gallop. These are linked in the latter case with the limiting of back mobility almost entirely to the lumbosacral joint.

The neural spines must be considered as levers, transmitting the muscular force to the vertebral bodies. Height and direction of the spines are determined by this force. The most important factor determining the differences in height of the spines between different mammals is the absolute size of the animal. For, with an increase in body-size the strength of the muscles relatively decreases and thus the length of their lever-arms must increase also. The differences in height of the spines in different regions of the vertebral column are determined by the importance of the muscles attached to them, height increasing with increasing importance of the muscle. The most favourable direction of the spines is perpendicular to that of muscular and ligamentous forces acting on them.

Attachment of muscles to periosteum of neural spines may be compared to a rope attached to a pile by a noose—perpendicular attachment prevents the rope slipping down.

The shape and size of the vertebral bodies of mammals depend on the static function of the body-axis to resist bending in the dorsal direction (ventral concave). Their dimensions are highly influenced, however, by the development of the other elements of the body-axis. The structure and development of the epaxial musculature are influenced by static factors (*e.g.*, the absolute size of the animal body) but they depend chiefly on the type of locomotion of the animals and the corresponding type of mobility of the vertebral column. Structure, development and inclination of the neural spines chiefly depend on the structure and development of the epaxial musculature and thus in the last instance chiefly on the type of locomotion.

Groups included in the work are Monotremes, Marsupials, Cetacea and Primates. The principal tendencies of phylogenetic development of the epaxial musculature of mammals are suggested and comparison is made with living Reptiles.—Reginald A. Green.

Preobrazhenskiĭ, P. P. (1946.) Eksperimenty po izmereniyu otkloneniĭ poyasnitsy pod deĭstviem tyazheti. [**Experiments in measuring deviation of the loins under the action of weight.**] —*Trud. vologodsk. moloch. Inst.* No. 7. pp. 211–214. **163**

The equipment for measuring movement of the lumbar region in the carcass of the horse, cat, dog, goat, pig, and cattle is described. Two tables were firmly fixed to each other and to the floor. The lumbar region of the vertebral column was clamped to one table by vices and a weight operated through a slot in the second table. Dependent on the direction from which the weight was applied movements of all the processes of the lumbar vertebrae were recorded. The lumbar region of the cat was the most mobile because in the cat the diameter of the intervertebral cartilage was least, and the spaces between the transverse and spinous processes were greatest. The lumbar region of the horse was the least mobile because of the shortness of the lumbar vertebrae (16% of the vertebral column), the lack of flexibility in the transverse and anterior articular processes, the lack of space between the processes, and the greater development of the spinous processes. In the cat the intervertebral cartilage was torn, and a fracture resulted after applying a weight of 2·5 kg. on the first lumbar vertebra. In the horse a fracture resulted from a weight of 15 kg. on the fourth lumbar vertebra or 30 kg. on the third and sixth vertebrae, and the second sacral vertebra was fractured with a weight of 128·5 kg.—G. R. Ritchie.

Hays, F. A. (1944.) **Chondrodystrophy in Rhode Island Reds.**—*Amer. Nat.* **78.** 54–58. **164**

The occurrence of a lethal defect in R.I.R. chickens is described. The chickens were all the progeny of one pen which consisted of a cockerel mated to two of his full-sisters and eight of his half-sisters. Affected chickens were produced from eggs of seven of the hens; they had wide flat heads with both mandibles markedly shortened; the long bones of both upper and lower limbs were much shortened with thickening of the humerus, ulna and tarsometatarsus. The femur was very crumbly and lacked a complete periosteum. Homozygous individuals died before hatching and the heterozygotes did not survive longer than seven days. The incidence was 172 normal to 54 abnormal, a very close approximation to a 3 to 1 ratio and the defect was apparently due to a simple recessive gene.—M. C.

Menkin, V. (1947.) **Biochemistry of inflammation.**—*Lancet.* **252.** 660–662. Summary copied *verbatim.* **165**

The altered chemistry of injured cells liberates into the inflammatory exudate various biochemical substances which are responsible for the clinical features of inflammation.

Leukotaxine increases local capillary permeability and diapedesis of leucocytes. The leucocytosis-promoting factor induces a discharge of immature leucocytes from, and hyperplasia of granulocytes and megacaryocytes in, bone-marrow.

Necrosin exerts a necrotic effect on local cells and, after absorption into the blood-stream, on

distant organs. Pyrexin induces fever. The leucopenic factor induces leucopenia, the leucocytes apparently being trapped in lungs, liver, and spleen.

See also abst. **243** (an introduction to bacteriological chemistry).

POISONS AND POISONING

JOVANOVITS, J. (1944.) Beitrag zur experimentellen Fluorosteopathie. **[A contribution to experimental fluorosis as it affects bone.]**—*Arch. Gewerbepath. Gewerbehyg.* **12.** 233–276. [Abst. in *Bull. Hyg., Lond.* **21.** 182–183. (1946.), copied *verbatim*. Signed ROBERT WEAVER.] **166**

The author gives a summary of some published work on chronic fluorosis in man and in the herbivora, dealing with the varying manifestations produced by differences in fluorine dosage, duration of the intoxication, type and age of the fluorosed animals, and the nature of the fluorine compounds ingested. His own experiments were carried out on rabbits, using young animals (6–7 weeks) and mature animals (11–13 months), and giving them either NaF, CaF_2, Na_2SiF_6, or Na_3AlF_6. For half of the animals, both young and mature, the daily dose was 5 mgm. per kilo. body weight; for the remainder the daily dose was 50 mgm. per kilo. Many of the animals died within periods ranging from about 14–33 weeks. With the smaller dose there was usually a latent period of about 80 days before ill-effects, such as loss of weight, were observed; with the larger dose the latent period was approximately halved. The most toxic compound was Na_2SiF_6, and since the solubility of this salt is considerably less than that of NaF, the author concludes that the toxicity of fluorine compounds is not primarily dependent on their solubility.

The author's other observations were concerned mainly with the effect of fluorine on the skeletal system. In the rabbits the first effects appeared in the tibia, radius and ulna. Later the humerus and femur showed changes, but the pelvis and spine remained apparently unaffected. He estimated the apparent and the absolute specific gravity of the affected femora—the former figure being calculated from the weight of the whole bone, and the latter from the weight of the compact portion. During the experimental period the absolute specific gravity remained practically the same for all animals, both experimental and control, but the apparent specific gravity was reduced in most of the fluorine-fed animals from an average of about 1·40 to about 1·10. These results are consistent with an increase in the size of the medullary cavity in the fluorosed animals. The effect on the bones, unlike the effect on the weight curve of the rabbits, appeared to be independent of the form in which the fluorine was administered.

GREEN, H. H. (1946.) **An outbreak of industrial fluorosis in cattle.**—*Proc. R. Soc. Med.* **39.** 795–796. Discussion p. 796. **167**

An outbreak of fluorosis in Lincolnshire, associated with the calcining of ironstone [a native iron carbonate], is reported. During the calcining process smoke drifted in to neighbouring farms and in the nearest led to the development of an obscure disease of cattle. The ironstone contained 1·200 p.p.m of fluorine, much of which was lost in the smoke. Grass samples within a few hundred yards of the burning mounds had a high concentration of fluorine. The danger zone probably did not exceed a radius of two miles. The cattle were stunted and lame and some had to be destroyed after "crawling on their knees". Examination of the fluorine content of the urine is important when fluorine intoxication is suspected.—J. M. ROBSON.

MØLLER, S. (1941.) Om Roer og Roeforgiftning. **[Poisoning due to feeding on roots.]**—*Maanedsskr. Dyrlaeger.* **53.** 157–168. **168**

The use of root crops in domestic animal feeding became prevalent in 1941 due to the absence of oil cake and concentrates and the shortage of corn and hay. Horses tolerate root crops quite well provided these are clean, although young animals stand soil contamination of food much better than the older horses. The cow is remarkably unaffected by soil in the food. The root crops available are those of the beet family [Chenopodiaceae], mangolds, sugar beet and strains of sugar beet developed for sugar production, and the Crucifereae, turnips and swedes. The composition of the plants is discussed. The high content of vitamin A and protein in beet tops makes these valuable for feeding cattle despite the presence of oxalic acid. Changing cattle from a diet of beet tops to swedes does not cause poisoning but this can occur during the transition from grass or swedes to the other plants belonging to the Chenopodiaceae. The symptoms of beet poisoning are described in an account of several cases. The symptoms of acetone poisoning do not wholly resemble those of beet poisoning and acetonuria may occur during beet feeding in otherwise healthy cattle. Potassium poisoning resembles beet poisoning more closely in its effects, but beet

leaves and swedes which are rich in potassium do not cause beet poisoning. M. advocated the use of beet leaves and the more extensive cultivation of swedes for feeding purposes.—E. F. McC.

Riek, R. F., & Wright, S. E. (1946.) **The toxic properties of the volatile oil of *Myoporum acuminatum* R. Br.**—*Aust. vet. J.* **22.** 149–153. **169**

The oil of *Myoporum acuminatum* was toxic for sheep and g. pigs, the toxic properties being confined to the highest boiling fractions of the oil. Clinical symptoms in the sheep were not marked and included icterus, proteinuria and high serum bilirubin levels. At autopsy the most marked feature was a severe haemorrhagic gastro-enteritis with free blood in the caecum and colon. Haemorrhages were present in subserous and subcutaneous tissues, particularly under the epicardium about the coronary vessels. Degeneration of kidneys and liver was observed microscopically.—D. C. Blood.

See also absts. **137** (phalaris staggers); **201** (toxicity of mercurial compounds).

PHARMACOLOGY AND THERAPEUTICS

Francis, J. (1946.) **The chick embryo in chemotherapeutic research.**—*Proc. R. Soc. Med.* **39.** 796–799. **170**

The bacteria were usually inoculated on to the chorio-allantois. Application of the drug to the chorio-allantois resembles local application to a wound, inoculation into the allantois may be compared with hypodermic therapy, and inoculation into the yolk sac bears some resemblance to oral administration. The results obtained with a number of sulphonamides, penicillin and proflavine against infections with *Str. agalactiae* and other organisms are quoted. These results are less consistent than those obtained in the mouse, but certain tests can be carried out on the chick embryo which cannot be performed in the mouse, and the chick embryo is susceptible to a number of infections to which laboratory animals are resistant.—J. M. Robson.

Frieden, E. H. (1945.) **The nature and action of the antibiotics.**—*Texas Rep. Biol. Med.* **3.** 569–646. [Abst. in *Rev. appl. Mycol.* **25.** 306. (1946), copied *verbatim.* Signed E. H. Frieden.] **171**

The author describes this paper as "an attempt to correlate the most important available data relating to the nature, biological activity, and mode of action of the antibiotics". Without claiming to be exhaustive, the discussion is believed to include essentially all the specific chemical entities that have been shown to exhibit antibiotic activity. An 11-page bibliography is appended.

Sannié, C. (1946.) Pigments et substances antibiotiques des champignons et des bactéries. **[Pigments and antibiotic substances from fungi and bacteria.]**—*Exposés ann. Biochim. méd.* **6.** 225–280. **172**

This review contains an immense bibliography, but owing to the severance of France from the outside world during the period of the German occupation S. has found it impossible to consult in the original form much of the literature on antibiotics, although that dealing with pigments has been more extensively covered.

Of pigments occurring in fungi the principal ones studied intensively include the carotenoids, flavines, thiochromes, the cytochromes (of yeast) and quinone derivatives, most of the latter belonging to the series of benzoquinones or toluquinones, phenyl benzoquinones, diphenyl benzoquinones and to the anthraquinones. Consideration is also given to the xanthone derivatives associated with fungi. Many pigments belonging generally to the anthraquinone series still await the discovery of their exact chemical constitutions.

The history of antibiotics of fungal and bacterial origin is traced, including the products gramicidin and tyrocidine, and details are given of their known chemical and physical properties. Amongst the antibiotics derived from fungi are included those from the *Actinomyces*, *Aspergillus* and *Penicillium*. The properties of penicillin are given in greater detail with discussion on preparation, physical and chemical properties, tests of activity, antibiotic power, and a brief review of its practical application. The article concludes with a brief discussion of the mode of action of these antibiotics.—A. Eden.

Levaditi, C., & Vaisman, A. (1945.) Mécanisme de la lyse pénicillinique "in vitro". **[The mechanism of lysis by penicillin *in vitro*.]**—*Bull. Acad. Méd.* **129.** 564–575. [Abst. in *Bull. Hyg., Lond.* **21.** 258. (1946), copied *verbatim.* Signed: L. P. Garrod.] **173**

Films of *Staph. aureus* in broth containing 10, 1 and 0·1 units of penicillin per ml., made at intervals during incubation and stained by silver impregnation methods, showed swelling of the cocci, and, between the 8th and 21st hours, loss of affinity for the stain. Measurements and photographs of such organisms are given; their appearance suggested that only the "stroma" of the bacterial cell remained, and sometimes an appear-

ance suggesting " herniation " of its contents was observed. Cultivation showed that a few cocci had survived (Bigger's " persisters "). Similar effects were produced in *Bact. coli* by penicillin of a concentration of 400 units per ml. in *Salm. paratyphi A* & *B* by 500 units, and in *Treponema duttoni* by 2,000 units. Similar loss of affinity for silver without increase in size was observed during lysis by bacteriophage, but not during " autolysis " (in distilled water, isotonic or hypertonic saline, or in contact with ether). The authors speculate on the nature of the mechanism by which penicillin abolishes the affinity of the bacterial cell for silver.

WAKSMAN, S. A., GEIGER, W. B., & REYNOLDS, D. M. (1946.) **Strain specificity and production of antibiotic substances. VII. Production of actinomycin by different actinomycetes.**—*Proc. nat. Acad. Sci., Wash.* **32.** 117–120. [Abst. in *Bull. Hyg., Lond.* **21.** 693. (1946), copied *verbatim*. Signed: L. P. GARROD.] **174**

Two supposedly distinct antibacterial substances designated Actinomycin A and B have been said by Waksman and his colleagues to be formed by different strains of *Actinomyces antibioticus*. This paper gives reasons for concluding that one of these is merely a grossly impure form of the other. It is therefore proposed that the designations A and B be abandoned.

WAKSMAN, S. A., BUGIE, E., & SCHATZ, A. (1944.) **Isolation of antibiotic substances from soil micro-organisms, with special reference to streptothricin and streptomycin.**—*Proc. Mayo Clin.* **19.** 537–548. [Abst. in *Rev. appl. Mycol.* **25.** 308. (1946), copied *verbatim*.] **175**

The production of streptothricin and streptomycin by certain Actinomycetes is considerably influenced by the composition of the medium and growth conditions. The presence of a growth-promoting substance, such as is found in meat extract, is essential for the production of streptomycin, but not for that of streptothricin. Tryptone or peptone and glucose favour the formation of both.

Both streptomycin and streptothricin are stable against destruction by various organisms; both are sensitive to increasing acidity and the presence of glucose; both resist high temperatures. Both act on various Gram-positive and Gram-negative bacteria, but streptomycin is more active against some bacteria of each group, e.g. *Bacillus mycoides* and *Mycobacterium tuberculosis* in the former, and *Proteus vulgaris* and *Pseudomonas aeruginosa* in the latter, than is streptothricin. Both show limited toxicity to animals and marked activity *in vitro* against various Gram-positive and Gram-negative bacteria.

FELDMAN, W. H., & HINSHAW, H. C. (1944.) **Effects of streptomycin on experimental tuberculosis in guinea pigs: Preliminary report.**—*Proc. Mayo Clin.* **19.** 593–600. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 7. 39. (1945), copied *verbatim*. Signed: B. G. P. SHAFIROFF.] **176**

Streptomycin is a newly discovered antibiotic agent possessing bacteriostatic and bactericidal effects vs. *Mycobacterium tuberculosis*. Its effect on the pathogenesis of exptl. tuberculosis in guinea pigs was studied. In the 1st group of 12 guinea pigs, 8 served as controls and 4 were given daily injns. of 2,775 u. of streptomycin for 54 days. In the 8 controls tuberculosis was grossly evident and widely disseminated. In the treated animals tuberculosis was minimal, arrested and non-progressive. *M. tuberculosis* was recovered from the spleen of only 1 of the treated guinea pigs. In a 2d. series, 10 controls and 10 animals treated with a newer, more refined prepn. of streptomycin were studied. The latter were given daily injns. of 3,000 to 6,000 u. There were indications of toxicity as manifested by loss of wt. and reduction of Hb conc. The antituberculosis effect was marked in the streptomycin-treated animals as compared with controls in which tuberculosis was widely disseminated. The index of infection was 67 in the untreated animals, 5·8 in the treated animals.

SCHATZ, A., & WAKSMAN, S. A. (1944.) **Effect of streptomycin and other antibiotic substances upon *Mycobacterium tuberculosis* and related organisms.**—*Proc. Soc. exp. Biol., N.Y.* **57.** 244–248. **177**

M. tuberculosis human (strain H.37), *M. tuberculosis* avian, *M. phlei*, *B. subtilis*, *B. mycoides*, *E. coli*, *Ps. aeruginosa*, and *E. muriseptica* were subjected to the *in vitro* antibacterial action of streptomycin, streptothricin, chaetomin, fumigacin, clavacin, actinomycin, and gliotoxin. In addition several typical actinomycetes were subjected to the action of streptomycin only. It was found that, in addition to wide differences in the sensitivity of the same organism to different antibacterial agents, there were marked differences in the sensitivity of different species or even strains of the same species to the same substance. Of the mycobacteria tested, *M. phlei* was the most sensitive to all the antibacterial agents while human bacilli were more sensitive to streptomycin and streptothricin than were avian bacilli. It is noted that *A. griseus*, the organism that produces streptomycin, elaborates a second antibiotic factor which is more active against the avian than against the human strain of *M. tuberculosis*.—J. L. McG.

HOLLANDE, A. C. (1946.) L'action de la clitocybine sur le bacille tuberculeux et autres

microbes. **[The action of clitocybin on the tubercle bacillus and other microbes.]**—*Atomes.* **3.** 1–5. [Abst. in *Rev. appl. Mycol.* **25.** 309. (1946), copied *verbatim.* Signed: A. C. Hollande.] **178**

Clitocybe candida, an edible fungus occurring in Alpine meadows at an altitude of 800 to 1,000 m. in the Isère Department, France, yields an extract, clitocybin, which was experimentally shown to exert a bacteriostatic effect on *Staphylococcus aureus*, the tubercle bacillus [*Mycobacterium tuberculosis*] (which was particularly sensitive), *Brucella abortus*, the coli bacillus [*Bacterium coli*], and the pyocyanic bacillus [*Bacillus pyocyaneus*]. After extraction by sulphuric ether and purification, clitocybin redissolved in water, is innocuous to guinea-pigs. Progressive and total lysis of *M. tuberculosis* was observed in infected guinea-pigs treated with the antibiotic.

Gerundo, M. (1947.) **Influence of sulfasuxidine and succinic acid upon the tubercle bacillus.**—*Amer. Rev. Tuberc.* **55.** 552–555. [Spanish summary, author's summary copied *verbatim.*] **179**

The addition of sulfasuxidine to bouillon-glycerol did not inhibit the growth of the tubercle bacillus, but induced development of long granular rods and beaded forms.

When Long's synthetic medium was used, the bacteria grew more abundantly in the tubes containing sulfasuxidine, either alone or with para-aminobenzoic acid.

On the assumption that the succinic acid radical present in sulfasuxidine was the factor stimulating growth, the bacteria were cultured in a modified synthetic medium, in which sodium succinate was substituted for asparagine; this modified form supported better growth than the original medium.

It seems reasonable to conclude that asparagine is not necessary for growth as a source of amide-nitrogen and amino-nitrogen and that succinic acid, which is the structural element of both forms of nitrogen, is the factor involved in the development of the bacterium. Para-aminobenzoic acid was not essential for growth, but its role was concerned with the formation of pigment.

Lehmann, J. (1946.) **Chemotherapy of tuberculosis: the bacteriostatic action of p-aminosalicylic acid (PAS) and closely related substances upon the tubercle bacillus, together with animal experiments and clinical trials with PAS.**—*Svenska Läkartidn.* **43.** 2029. [Abst. in *Amer. Rev. Tuberc.* **55.** No. 6. p. 169 of absts. (1947), copied *verbatim.* Signed: W. C. Tobie.] **180**

Data are given on the concentration of various amino- and hydroxy-derivatives of benzoic acid which inhibit the growth of the tubercle bacillus *in vitro*. Of 60 compounds tested, 2-hydroxy-4-aminobenzoic acid (p-aminosalicylic acid, "PAS") was the most active, having bacteriostatic action in concentrations as low as $10^{-5.5}$ molal. Mice, rats and rabbits tolerated PAS well when fed 5 per cent of the compound in their food. Guinea pigs became emaciated, lost hair, and died in one to two weeks or less, nevertheless PAS had some protective action in animals injected intraperitoneally with 3 mg. of virulent human tubercle bacilli. PAS appeared to delay or arrest the progress of tuberculosis in some human cases. It was usually given by mouth in doses of 5, 3, 3 and 3 g. at four-hour intervals during the day. Owing to its rapid elimination from the body, the blood levels of PAS varied greatly, but usually averaged 3 to 6 mg. per 100 cc. of blood. Benzocaine and cycloform (the ethyl and isobutyl esters of p-aminobenzoic acid) were nearly as tuberculostatic *in vitro* as PAS, and might be useful in the local treatment of painful tuberculous lesions such as laryngeal tuberculosis. PAS has only a bacteriostatic action against the tubercle bacillus, but appears to be a useful drug.

*Savarino, S., & Oricchio, D. (1943.) Presenza di proprietà attivanti o inibenti nei terreni liquidi che sono serviti allo sviluppo di bacilli acido-resistenti tubercolari e nontubercolari. **[Bacteriostatic property of culture filtrates of tubercle and other acid fast bacilli.]**—*Ann. Ist. Carlo Forlanini.* **7.** 408. [Abst. from abst. in *Amer. Rev. Tuberc.* **52.** p. 49 of absts. (1945.)] **181**

The growth of the tubercle bacillus is inhibited by the filtrate of a liquid culture medium, which previously had been used for the culture of tubercle bacilli and other acid fast bacilli. On the other hand a filtrate of a tubercle bacillus culture favours the growth of some acid fast bacilli other than the tubercle bacillus.

Siegel, M., Karr, H. V., & Julianelle, L. A. (1945.) **The epidemiology of acute respiratory infections conditioned by sulfonamides. V. Carrier epidemics of sulfonamide-resistant pneumococci.**—*Amer. J. Hyg.* **41.** 228–241. [Authors' summary copied *verbatim.*] **182**

Generalized carrier epidemics of drug-resistant pneumococcal types 11 and 18A following prolonged oral use of sulfadiazine have been described in an institutionalized population of feeble-minded children highly susceptible to acute infections of the respiratory tract. The period of observation lasted from December 1942, through May, 1944.

Strains of either type 11 or 18A were found

at some time in all of 30 treated children and in 90 per cent of untreated contacts. The duration of the carrier stage varied with the individual from less than a month to at least 15 months in the case of a single chronic carrier.

Strains isolated 14 months after discontinuance of drug therapy were as highly refractory to the action of sulfadiazine as those isolated during drug therapy. Their occurrence as normal carrier types complicated the etiological diagnosis of acute respiratory infections, particularly where sulfonamides were used.

The organisms possessed low virulence for mice and were not invasive for man under the prevailing conditions. However, under different circumstances affecting the susceptibility of the host or the virulence of the infecting agent, the wide dissemination of permanently drug-resistant strains in the course of chemotherapy might be obviously hazardous.

The prevalence of drug-resistant pneumococcal strains depends on at least two factors, the use of chemotherapy and the presence of new contacts. Without the aid of sulfonamides and in the absence of new contacts, the resistant strains eventually disappear in all except chronic carriers. The natural conditions responsible for the spontaneous elimination of drug-resistant strains from the nasopharynx counteract the tendency of chemotherapy to increase the number of such strains.

DE MACEDO, L. R. T. (1944.) Ação da fenotiazina sôbre protozoários entericolas de "Meleagris gallopavo doméstica" e "Galus domesticus". [**Use of phenothiazine against protozoan infections of turkeys and chickens.**]—*Bol. Inst. Vital Brazil.* No. 27. pp. 47–57. [English summary.] [Spanish version appeared in *Gac. vet., B. Aires.* **7.** 156–164. (1945).] **183**

Satisfactory results are recorded for the treatment of outbreaks of disease in turkeys with phenothiazine; salicylic acid, atebrin [mepacrine] and spirocid [acetarsol] proved of little value. Phenothiazine was administered by mixing 0·5 g. powder per head into the dry mash daily as a curative, and the same dose three times in three months as a preventive. For fowls the dose was reduced to 0·2 g. per head.

The outbreaks of disease concerned were ascribed to blackhead, trichomoniasis, spirochaetosis and coccidiosis. The drug is claimed to have given good results in each case, particularly as a preventive; its value in blackhead might be due to elimination of the carrier, *Heterakis*.

The nature of the diseases was determined by P.M. examination and also by microscopic examination of the intestinal contents. Though deaths ceased in periods varying from 3–20 days after treatment, as no controls were left untreated, it is doubtful how far the result was due to the treatment.—U. F. RICHARDSON.

I. SCHMID, G. (1946.) Beitrag zur Therapie der Geflügelcoccidiose. [**Treatment of fowl coccidiosis with phenothiazine.**]—*Schweiz. Arch. Tierheilk.* **88.** 413–417. **184**

II. LEUENBERGER, M., & KÖNIG. (1946.) Die Behandlung der Kaninchencoccidiose. [**Treatment of rabbit coccidiosis with phenothiazine.**]—*Schweiz. Arch. Tierheilk.* **88.** 417–423. **185**

I. Chicks totalling 500 in 18 infected flocks were given phenothiazine in a dosage of 0·2–1·0 g. per bird per day for ten days at the age of 4–10 weeks. Therapeutic results were good in 14 flocks and unsatisfactory in the rest. P.M. examination of treated birds revealed a residual coccidial infection in the caeca.

II. Phenothiazine was given to 54 rabbits in 11 different stocks in a ten day course of 0·5–1·0 g. per kg. per day. All the stocks were infected with coccidiosis and some of the treated rabbits were clinically ill. Both intestinal and hepatic types of coccidiosis were present initially. The treatment stopped death losses and brought about improvement in the affected animals and the intestinal infection was reduced though not eliminated. The drug was mixed with the food and was readily raken.—J. E.

AGUL'NIK, M. A. (1943.) Formalin pri lechenii piroplazmoza i nuttallioza loshadeĭ. [**Formalin for treatment of equine piroplasmosis.**]—*Veterinariya, Moscow.* No. 10–11. pp. 24–26. **186**

Owing to the scarcity of standard drugs for the treatment of equine piroplasmosis during the war, the value of intravenous injection of formalin was tested on naturally infected animals. Preliminary experiments indicated that a suitable dose was 100 ml. of a 4% solution in physiological saline. An 8% solution caused a rise of temperature and accelerated respiration in normal animals, and a 5% solution caused an increase in the pulse rate and lachrymation. 20 cases of *B. equi* or *B. caballi* were treated with 1–3 doses of formalin given intravenously in the course of three days, or in seven cases 200 ml. repeated in two days. 19 animals recovered and one died.

It is concluded that the intravenous injection of formalin can be used with success in the treatment of equine piroplasmosis, but that it should be used with care if the heart is affected (repeated small doses), whilst if weight and condition warrant it a dose of 200 ml. of a 4% solution can be used to get a quick effect. The injection does not cause necrosis if it enters the subcutaneous tissue.—U. F. RICHARDSON.

WITTE, J. (1944.) Erfahrungen mit der Begasung räudekranker Pferde durch Verbrennung von Schwefel und Diametan. **[Treatment of mange in horses in a gas chamber, by burning sulphur or "diametan".]**—*Dtsch. tierärztl. Wschr./ Tierärztl. Rdsch.* **52/50.** 65–69. **187**

By fumigation inside special gas chambers a large number of horses affected with mange were successfully treated. A concentration of 3·5–4·0% of sulphur dioxide was found to be the most effective for this purpose, and was maintained inside the chamber by burning sulphur or "diametan" [pure sulphur with a catalyst] in a specially constructed oven built at the side of the chamber. The arrangements required for the burning of the sulphur and the delivery of the sulphur dioxide into the chamber are described. It was found that a gas concentration of 3% was about the lower effective limit in mange treatment. The temperature inside the chamber was 30–40°C. The concentration of sulphur dioxide was found to fluctuate considerably during a fumigation, and the factors affecting this and the adjustments in the amounts of sulphur or "diametan" employed are given in detail. About 100–125 g. sulphur or "diametan" per cu. m. of chamber volume were employed, although not all of this was subsequently found to have been burnt. Precautions necessary for securing the horse in the chamber are described and photographs of gas chambers actually used are given.—LEWIS DAVIES.

RATHSAN, E. W., & MEIRA, M. P. (1943.) Chaulmoogro—terapia. A sarna demodéxica dos cães e o seu tratamento. **[Chaulmoogra oil in the treatment of demodectic mange of dogs.]**—*Bol. Soc. brasil. Med. vet.* **12.** 247–255. [English summary.] **188**

Previous to the treatment of demodectic mange with esters of chaulmoogra oil the authors supplemented local application with intramuscular or subcutaneous injections of the same esters, but found that toxic effects were common. They now find that the simple external application effects a permanent cure, avoiding toxic reactions.
—MILLER WATSON.

BENDAYAN, J. P. (1944.) Contribución al tratamiento de las pleuresías serofibrinosas del caballo. **[Treatment of serofibrinous pleurisy in the horse.]**—*Rev. Med. vet., B. Aires.* **26.** 330–336. **189**

Large doses of calcium chloride, 12–24 g. daily, and urotropine 10–25 g. daily, administered intravenously, proved to be successful treatment for serofibrinous pleurisy in five horses.
—H. G. ARAMBURU.

QUIGLEY, G. D., & CORY, E. N. (1946.) **The utility of DDT for the control of poultry ectoparasites.**—*Poult. Sci.* **25.** 419–421. **190**

D.D.T. is a most effective means of control of external parasites of poultry, but when used in excessive amounts there may be danger of poisoning. The most satisfactory and safest method is to treat the birds while roosting with 20% D.D.T. in pyrophyllite dust, repeating the application after two weeks. Generally dusts containing up to 20% D.D.T. and emulsions up to 1% D.D.T. were found to be relatively safe. Oral administration of 50 mg. of D.D.T. in capsules daily, for periods over 10 days indicated the presence of cumulative effects, which were absent when the same amount was mixed with the feed. Also oral administration of single doses of from 100–250 mg. per kg. body weight indicated that all levels were within the toxic or sub-toxic, but not the lethal range. At autopsy these birds revealed diffuse enteritis, areas of mild necrosis in crops, atonic condition of the gizzard and a moderate and light mottling of the kidneys. The feeding of D.D.T. to hens and the treatment of eggs with D.D.T. dusts or powders had no effect upon hatchability.—W. MOORE.

I. POTTS, W. H., & VANDERPLANK, F. L. (1945.) **Mode of entry of contact insecticides. [Correspondence.]**—*Nature, Lond.* **156.** 112. **191**

II. HICKIN, N. E. (1945.) **Mode of entry of contact insecticides. [Correspondence.]** —*Nature, Lond.* **156.** 753–754. **192**

I. From experiments with the tsetse fly the authors conclude that the mode of entry of contact insecticides is through the pulvilli, and that the speed of action of these poisons is most rapid when the pulvilli are well developed.

II. In opposition to this general view, H. finds that the pulvillus in *Haematopinus suis* and *Trichodectes latus* is poorly developed and that the entry of contact insecticides into both these species is through the tarsi only.—W. MOORE.

REĬNGARDT, L. V., & ZABUD'KO-REĬNGARDT, T. N. (1945.) Romashka obyknovennaya (Matricaria inodora) kak khoroshiĭ, no malo izuchennyĭ insektitsid. **[A good but neglected insecticide, *Matricaria inodora*.]**—*Med. Parazitol., Moscow.* **14.** No. 3. 92. **193**

Tests were made with *Matricaria inodora* as a possible source of insecticide. Leaves and flowers were dried, and pulverized. *Musca corvina* was used as the test insect. In 10 tests dusting of the flies with powder from the leaves gave unsatisfactory results. On the other hand, in a series of 30 tests the powder from the flowers, even when coarse, was no less effective than pyrethrum.

The authors suggest that *Matricaria inodora*

can be regarded as an insecticidal plant and, in view of its extensive distribution, can be widely used.—S. W. SALTER.

MEYER, J. R. (1943.) Ação direta do alho sobre bernes. **[Direct action of garlic on screwflies.]** —*Biologico, S. Paulo.* **9.** 379–382. **194**

Seven experiments are described to prove the toxic action of garlic pulp when directly applied to screwflies (*Cochliomyia americana*) in a humid atmosphere at 37°C. The results were inconclusive. —H. G. ARAMBURU.

HABERMANN, R. T., & CARLSON, F. N. (1946.) **Lead arsenate relieves scouring in lambs due to tapeworm infestation.**—*Vet. Med.* **41.** 306–310. **195**

In trials with lead arsenate it was found that a dose of one gramme of the drug per animal, the only dosage tried, removed *Moniezia expansa* but not *Thysanosoma actinioides* from infested lambs. The estimated efficacy of the single treatment was approximately 91·8 per cent. when administered to scouring lambs which had notable improvement in appetite, general appearance and conformation within a week after medication. Evidence is advanced which indicates that *Moniezia* is an important cause of scouring in range lambs in western South Dakota, where the trials were made, although nematodes, particularly *Haemonchus*, may be predisposing or contributory causes of the condition.—J. N. OLDHAM.

SALOMON, LO., & SALOMON, LÉ. (1946.) Sur l'emploi combiné du vert brillant et du violet de gentiane dans le traitement de la strongylose gastro-intestinale du mouton. **[The combined use of brilliant green and gentian violet in the treatment of parasitic gastro-enteritis in sheep.]** —*Bull. Acad. vét. Fr.* **19.** 93–96. **196**

The vermifuge was given in capsules each containing 0·03 gr. of each of the two dyes. The dosage adopted was four capsules given in one day over a period of eight hours and repeated twice at intervals of a week. Successful results were obtained with this synergic anthelmintic. —L. M. MARKSON.

ERNST, A. M. (1946.) Pharmacologisch onderzoek betreffende enkele in de dagelijkssche praktijk aangewende geneesmiddelen. **[Pharmacological investigation of " colfin ".]**—*Tijdschr. Diergeneesk.* **71.** 518–522. [English and French summaries.] **197**

An account of the effect of a proprietary mixture, colfin, said to contain barium chloride, thymol, senna and buckthorn, on isolated g. pig intestine. There was no constant increase in peristalsis after its use and the composition of the essential ingredients of the mixture was inconstant.

NÖRR, J. (1944.) Zur Frage der Heilbarkeit des Dummkollers. **[The curability of " dumkoller ".]**—*Berl. Münch. tierärztl. Wschr./ Wien. tierärztl. Mschr.* July 7th. 216–217. **198**

This chronic nervous condition [apparently similar or identical with *Hydrocephalus internus* or *Hydrocephalus hypersecretorius*] has been regarded as incurable.

The case of a ten-year-old horse is described which was discarded from the army in 1936 and acquired by the veterinary clinic as a typical " dumkoller " case for demonstration purposes. After four months N. treated the animal with a preparation, " encephaline," containing iodine and turpentine oil saturated with camphor. This preparation had been used in encephalitis and pneumonia of foals as well as in Borna disease. One month later a slight, but progressive improvement was observed in the animal which after a further five months returned to normal and was used later in heavy agricultural work.—C. A.

OJEMANN, J. G. (1945.) Medicamenteuze behandeling van mammatumoren bij den hond. **[Sex hormones in treatment of mammary tumours in the bitch.]**—*Tijdschr. Diergeneesk.* **70.** No. 7. 161–163. **199**

The author reports that in treating two bitches, one for endometritis and the other for false pregnancy, with stilboestrol in 1940 he observed a marked diminution in the size of mammary tumours which were present in each of these animals. Because spontaneous decrease in size of these tumours does not occur as a rule he accepted that the stilboestrol injections were responsible for the phenomena observed. This was most unexpected since it is generally accepted that the female hormone may stimulate tumour formation. This belief is based on the fact that such tumours are uncommon in dogs and that transplantation of mammary tumours is usually more successful in bitches than in dogs. Ovarectomy reduces the susceptibility for mammary tumours and has been resorted to as a curative measure. According to some investigators continued administration of large doses of oestrogenic substances induces tumour formation. Attention is drawn to the similarity in composition of " menformon " and some cancerogenic substances. This suggests that theoretically an increase in growth and not an arrest of development should have followed stilboestrol administration. In his practice he treated several cases of mammary tumours with stilboestrol and almost invariably a marked reduction in size of the tumours resulted. In many cases extirpation of the tumours was not attempted until they had been considerably reduced by stilboestrol administration. War conditions rendered a thorough histological investigation of the nature of the

tumours, before and after treatment, impossible. The preparation appears to affect the parenchymatous tissue only, the fibrous connective tissue remains unaffected and surgical interference was necessary for the complete obliteration of the swelling. In almost completely ossified tumours the osseous tissues disappeared. This is accepted as proof that the hormone can affect parenchymatous tissues of mesenchymatous origin and that its action is by no means confined to tissues of epithelial origin. He refers to American findings that hypertrophy of the prostrate and carcinoma of this organ in man reacted to similar treatment. He disagrees with the American workers that the beneficial effect must be attributed to the use of a hormone from the opposite sex. He found stilboestrol useful in both dogs and bitches and believes that the hormone preparations have a specific anticarcinogenic action.—P. L. LE ROUX.

LAWSON, A., & RIMINGTON, C. (1947.) **Antithyroid activity of ergothioneine.**—*Lancet.* **252.** 586–587. **200**

Injected subcutaneously into rats, ergothioneine has an antithyroid activity similar to that of thiouracil as determined by the diminution of the iodine content of the thyroid. Ergothioneine is normally present in blood in concentrations which might produce an antithyroid action, and hence it should have advantages for clinical purposes.
—J. M. ROBSON.

LONG, W. K., & FARAH, A. (1946.) **Effect of some sulfhydryl-containing substances on the toxicity of an organic mercurial compound.**—*Science.* **104.** 220–221. **201**

The acute toxicity of an organic mercurial (salyrgan) on the mouse, cat and dog, and the heart lung preparation of the dog, can be counteracted by sulfhydryl-containing compounds such as glutathione, cysteine and 2,3-dimercaptopropanol (BAL), the latter being, in equimolar doses, about five times as active as glutathione and cysteine.—J. M. ROBSON.

See also absts. **2** (*Staphyl. aureus* and antibiotics); **10** (quarternary ammonium detergent and *B. anthracis*); **50** (stovarsol for coccidiosis); **88** (gammexane and D.D.T. for ticks); **95** (gammexane for various arthropods); **110, 111** (anthelmintics); **146** (methylene blue toxicity); **235** (veterinary anaesthesia).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

—. (1946.) **Milk in North America. A report submitted to the Ministry of Agriculture and Fisheries and the Department of Agriculture for Scotland by the members of the Milk Mission following their investigation in the United States of America and Canada during May and June, 1945.**—*Agric. Overseas.* Rep. No. 1. pp. 64. London: H.M. Stat. Off. 1s. 3d. **202**

The Mission paid special attention to all factors bearing on the production of milk, cropping measures, herd management, and labour. Speaking generally the pastures are poorer than in Gt. Britain and less heavily stocked but the general average yield of milk per cow is somewhat higher. This is accounted for by the fact that the great majority of the cattle are Friesians. The committee was much impressed by the success which has followed the campaign for tuberculosis eradication in the United States and the considerable progress made in Canada. All testing is undertaken by the Government free to the farmer and compensation at the rate of two-thirds their commercial value is allowed for reactors, which are all slaughtered. Contagious abortion is still a serious problem and much effort is being put into the scheme of testing and vaccination. Mastitis is still very prevalent and treatment only in its experimental stage. The technique of milking is believed to bear a marked relation to mastitis and many in the United States believe that improved methods of mechanical milking may prove to be an important move in combating mastitis. A useful technical film has been made on the subject.

A great deal of research in animal breeding is being carried on in the United States and the committee was impressed with the long-term experiments in this field of cattle breeding. Artificial insemination has made great progress in certain areas and considerable economies are now being made in reducing the type of housing for the bulls. Artificial insemination is not believed to be so much a veterinary matter as one for the stockman. The report contains ten appendices.
—D. S. RABAGLIATI.

FOOT, A. S. (1947.) **Efficient milking.**—*Agric. Lond.* **53.** 527–532. **203**

This article was written for the instruction of hand milkers and milking machine operators. Assisted by diagrams F. describes the anatomy of the udder in simple terms, and the action of the pituitary hormone in the "letting down" of milk.

In hand milking the object is to press the milk from the top of the teat sinus downwards, so that the pressure above the streak canal exceeds the atmospheric pressure, and so causes the sphincter muscle to open. In machine milking this difference in pressure is brought about by reducing the pressure outside the teat orifice. The pulsation of the teat-cup liner against the wall of the teat is calculated to allow blood to pass in the vessels of the teat wall and to prevent the

teat being sucked down into the cup, although in some cows this does tend to occur.

As much milk as possible should be removed at each milking. Some machine milkers strip by hand, but it is better to strip by pressing down on the teat-cup claw with one hand and massaging the quarters with the other. External udder injuries are known to predispose to mastitis, but it is probable that internal injuries are also important. The degree of vacuum inside the teat is reduced by the flow of milk, but, at the end of milking the full vacuum pressure affects the inside walls of the teat, so that teat-cups left on when no milk is flowing increase the risk of internal injury.

—J. O. L. KING.

ROSSI, P. (1945.) Histoire d'une toxi-infection d'origine carnée due à un paratyphique C. **[Toxinfection of meat origin caused by *Salmonella paratyphi C.*]**—*Rev. Méd. vét., Lyon et Toulouse.* **96.** 150–157. **204**

R. describes an outbreak of food poisoning in a large number of people who had partaken of the flesh of two young pigs. The history of the outbreak and the symptoms of those affected are described. It appears that the pigs, which had been ailing, had been examined by a veterinary surgeon on two occasions. Finally they were slaughtered and their carcasses examined by the same veterinary surgeon and passed as fit for human consumption. This verdict was confirmed by two other veterinarians. Later on other pigs from the same piggery were found to be sick and as the result of further examination a salmonella septicaemia was diagnosed.

The conditions liable to produce such outbreaks are discussed and it is asserted that *S. paratyphi C* affecting man is usually of porcine origin; such was the case in 12 outbreaks reported on by DULAC (1943). However, it seems that other causes are also possible, as pâté of beef, milk, ice cream and cheese have been also suspect.

R. suggests that for a better system of meat inspection the slaughter of animals and inspection of meat should be under veterinary supervision and that special laboratories should be set up to deal with doubtful carcasses within 36–48 hours. Inspection of carcasses should be much more detailed.—D. S. RABAGLIATI.

JERLOV, S. (1941.) Om den fôreskrivna anmälningsskyldigheten av vid köttbesiktning konstaterad tuberkulos. **[On the obligatory notification of tuberculosis found at meat inspection.]** —*Skand. VetTidskr.* **31.** 732–738. [Abst. from English summary.] **205**

New regulations for control of tuberculosis in cattle were made in Sweden in 1941, to come into force on 1st Jan., 1942. These state, *inter alia*, that the veterinary surgeon who finds TB. in cattle on examination of meat, is to report such cases to the Royal Board of Health or to the special tuberculosis sections in districts where these have been established by the agricultural societies.

The object is avoidance of delay in direct notification when TB. is found in previously TB.-free herds.

Two cases are described in which J. was notified, after examination of the carcasses, that TB. had again been found in two herds which had been declared free from TB. He emphasizes the importance of such notification and considers that the report should contain the seat and character of such tuberculous changes and also the name and address of the owner of the animal affected. It is important that the diagnosis should be supported by microscopic determination of the presence of TB.

J. hopes that much important information will be gained which will contribute to the speedier eradication of TB. in cattle in Sweden.

—F. E. W.

GISSKE, W. (1944.) Der natürliche Schutz des Hühnereies gegen bakterielle Zersetzung. **[Natural protection of hen eggs against bacterial decomposition.]**—*Z. Fleisch- u. Milchhyg.* **54.** 211–214 & 223–226. **206**

G. discusses methods by which losses of eggs preserved in cold storage may be reduced. Before the war, 10% of the total egg production in Germany was kept in cold storage, with average loss over a period of 5–6 months of 1–2% (7–8 million eggs).

Egg decomposition is caused by an outside bacterial infection. In protecting the egg against such decomposition, the egg-shell is of most importance. The egg-shell consists of three successive layers, an inner membrane, a calcareous shell and, most important, an outer skin or cuticle. Preservation of eggs in fresh condition for any length of time depends largely on the retention of the cuticle in a whole and undamaged state.

The usual practice of scrubbing, washing and soaking eggs before storing them down does a great deal of harm by damaging and loosening the cuticle, as the dirty water is sucked in through the opened pores. The cuticle may be completely destroyed if disinfectants are added to the water; acids do the greatest damage, alkali and sulphates are less harmful.

Soiled eggs should never be preserved. It was shown experimentally that the cuticle could be completely destroyed in 2–4 hours if contaminated with moist droppings. The contents of a rotten egg have similar effect if smeared on

the surface, the cuticle being destroyed within 10–12 hours. The contents of a fresh egg have no harmful effect.

In experiments with bacterial infection, in which various cultures were applied during a period of 16 hours, an old broth culture of *Pseudomonas fluorescens*, which is the main infective agent in cold storage, had the greatest effect: even an organism-free filtrate of the culture damaged the cuticle. A fresh broth culture and a precipitate of a fresh saline agar culture were less harmful. In all cases infection was in direct proportion to the extent to which the cuticle had been damaged. The conclusion drawn from this experiment was that as the cuticle was destroyed by even a filtrate free of organisms, the active agents were not micro-organisms themselves but proteolytic enzymes of bacterial origin.

Nyiredy demonstrated that as long as the cuticle remained intact, infection could take place only if micro-organisms capable of building up proteolytic ferments were present. Among the groups of micro-organisms examined *Proteus vulgaris*, *B. mesentericus* and, above all, *Ps. fluorescens* can penetrate the shell within a short time. Non-proteolytic organisms of the *Bact. coli-Flavobacterium-Achromobacter* group can infect the egg only when the cuticle has first been broken down in some way.

Modern methods of cold storage seek to inhibit the development of micro-organisms. Lescardé introduced storage in an atmosphere of carbon dioxide. Everaert modified the method, using a mixture of CO_2 and nitrogen with good results. Pennington, Moran and Rievel sought to increase natural resistance of albumen by storing eggs in specially constructed gas-cooling chambers under light pressure where eggs keep fresh for ten months and longer without any loss due to bacterial infection. The method requires large-scale technical installations and is for that reason of no great practical use. The so-called Danish method uses larger containers which are filled with gas mixture and stored in the ordinary way.

—E. Cherkesi.

Anon. (1947.) **Spray-dried egg and food poisoning.**—*Brit. med. J.* June 14th. 855–856. **207**

This is an editorial commentary in which the Medical Research Council's report on "*The bacteriology of spray-dried egg with particular reference to food-poisoning*" is discussed, with references to other papers. The author stresses the increase of communal feeding in Britain and the low standard of hygiene in the handling of food.—L. M. Markson.

Pires, A. (1944.) A proposito de la modificacion del plan de estudios de la carrera de medicina veterinaria. **[Concerning modification of the veterinary training course in Buenos Aires.]**—*Gac. vet., B. Aires.* **6.** 196–210. **208**

P. presents his views regarding a reorganization of the present courses in Veterinary Science in the Argentine.

He advocates two years of general non-technical training and three years of specialized post graduate training for husbandmen, bacteriologists, hygienists, clinicians and for veterinarians in the field. A complete syllabus for the whole training is discussed.—H. G. Aramburu.

Anon. (1941.) Les parcs nationaux du Congo Belge. **[National parks in the Belgian Congo.]**—*Bull. agric. Congo belge.* **32.** 454–495. [Dutch summary.] **209**

In November, 1934, four national parks of the Belgian Congo were formed for scientific research and protection of the fauna and flora. This total area comprises approximately 2,725,000 hectares (a little less than 6,812,500 acres):—the National Albert Park (809,000 hectares), the National Parks of Kagera (251,000 hectares) and Garamba (492,000 hectares) contiguous to the territories of Uganda, Tanganyika and the Anglo-Egyptian Sudan, and the National park of Upemba (1,173,000 hectares) within the Congo.

The report describes the activity of these parks during 1939 and the first months of 1940 under the headings of general conditions, supervision, natural population of fauna and flora, scientific studies and restriction of tourists. Seven maps and eleven photographic reproductions are included, also an appendix of the legal enactments creating each of the preserves. The effect of this preservation is shown by an increase of the gorilla and the rhinoceros and most of the game which were threatened formerly with extinction, and in the Park of Kagera especially there was a remarkable increase of zebra and all species of antelopes. Owing to the rare visits of human beings to the reserves, the animals became less suspicious and hostile. The hippopotamus which was essentially a nocturnal animal, showed a partiality for day activity and became less restless.

—D. S. Rabagliati.

See also absts. **232** (in U.S.S.R.); **233** (meat inspection); **239** (systematic technique for meat inspection).

LIVESTOCK HYGIENE

Pichugin, V. M., Alikaev, V. A., & Troyanovskiĭ, D. P. (1940.) K voprosu o shirine dvoĭnykh kormovykh prokhodov v skotnykh dvorakh v svyazi s profilaktikoĭ kapel'noĭ

infektsii. **[The Arrangement of the stalls in double-rowed cow sheds in connexion with droplet infection.]**—*Veterinariya, Moscow.* No. 3. pp. 79–81. **210**

To determine the incidence of droplet infection in cow sheds with double rowed arrangement of stalls the authors carried out four series of 22 tests with *B. prodigiosus* using the Flügge method. It was found that infected saliva can be ejected forward over a distance of 5 m. if the air is flowing in the same direction at a speed of 0·05–0·1 m/sec., with a contrary air current the distance is over 3·5 m. Conclusion is reached that the customary head-to-head arrangement of stalls in double rows at a distance of 0·7–2·5 m. exposes the animals to the danger of possible droplet infection. The authors agree with the view expressed earlier by Klimmer and Rueff of the Iowa Experimental Station, U.S.A., that the most hygienic method is back-to-back arrangement of stalls in double rows.—E. CHERKESI.

SCOTT, L. P. (1946.) **Atlantic crossing. 23 days at sea with a shipload of horses.**—*Fort Dodge Biochem. Rev.* **17.** No. 2. 10–11. **211**

Scott relates his experiences on a Liberty ship on a 23 days' voyage from Newport News to Danzig with 376 horses (mostly pregnant mares) being shipped for UNRRA. The animals were taken over from stockyards after long railroad journeys, where they had been in contact with influenza. Several seriously sick horses were disembarked or rejected before shipment. Two died within a few hours of being embarked. Mortality was about 9·84%. There was a quite inadequate supply of drugs of serum for treating the disease. All the 36 animals that died showed pulmonary symptoms. There were no digestive disorders treated. In rough weather the horses showed much irritation, biting or kicking neighbours or attempting to bite attendants. The ration given was oats 2 lb., hay 20–25 lb., and water 6 gallons.

To reduce losses it is recommended that horses for shipment should undergo a seasoning process in stockyards in the mid-west to get over influenza before being railed to east and west coast embarkation points.—J. A. GRIFFITHS.

See also abst. **237** (in U.S.S.R.).

ZOOTECHNY

—. (1944.) **Trucking livestock in the corn belt region.**—*Bull. Mo. agric. Exp. Sta.* No. 479. pp. 56. **212**

The bulk of the livestock marketed in the Corn Belt is transported by motor truck. The Corn Belt Livestock Marketing Research Committee with the co-operation of the Bureau of Agricultural Economics undertook a research study of efficient transportation of livestock, and other farm products.

The practice of hauling livestock to market in less than full loads is only too common, but the number of full return loads is even less. In 1940 87% of livestock from auctions and 75% from assembly yards in the Corn Belt were carried by motor truck. The average distance over which stock is carried varies greatly; in 1940 it was found to be nine miles for local co-operative associations and 79 miles for packing plants. Some railroads have inaugurated a combination of truck-pickup and rail transportation service for livestock.

As would be expected the average space required per head increases as the weight of the animal increases; thus a 150 lb. calf. requires 3 sq. ft. of space, while a 1,400 lb. steer 15 sq. ft. A 100 lb. pig requires 2 sq. ft., but one weighing 350 lb. 45 sq. ft. Truckers usually allow more space per head on the upper deck than on the floor.

Recommendations are given for improving efficiency in trucking. Mathematical formulae are inserted showing how various measures of livestock trucking efficiency are computed. The report ends with numerous statistical tables illustrative of the investigation.—D. S. RABAGLIATI.

ROBINSON, E. M. (1946.) **Black quarter.**—*Fmg S. Afr.* **21.** 522–530. **213**

This is a short description of the symptoms, lesions and prophylaxis of blackleg (*Cl. chauvoei* infection). In South Africa it is essentially a disease of uncultivated land. In recent years heavy losses have occurred at times in sheep after shearing, as a result of infection of shearing wounds. The disease may occur on farms where blackleg in cattle is rare or absent. Annual vaccination of cattle between the ages of six months and three years with a formolized vaccine is advised on infected farms.—M. C.

SENGIR, E. (1943.) Sanayide derilerin kiymetini gideren ve azaltan hastaliklar ve bunlarin deride yaptiklari Anatomik ve Histolojik bozukluklar. **[Skin diseases which damage or destroy the leather, and their pathology and histopathology.]**—*Sayi Ankara Yüksek Ziraat Enstitüsü.* No. 137. pp. 135. [Abst. from German summary.] **214**

The need for exporting leather of high quality is stressed and the faults it may contain discussed

with regard to faults in the skin of the living animal, faults in skinning, damage during storage and damage and faults in manufacture.

Some cattle hides contain collagen fibres that are too thin and are therefore not first class. In examinations made, the quality of sheepskins was potentially high, but horse skins were only mediocre and of limited use. The methods of husbandry in Turkey are primitive and standards of cleanliness low, which leads to much spoilage of skins during life through soiling and consequent irritation and inflammation. The effects of many infectious diseases are discussed; the main lesion is hyalinization of collagen fibres or their disappearance. Occasional leucocytic infiltration is found. Twisting of the grain in pox diseases is recorded. Skins from animals with glanders or rinderpest are considered useless. The principle factors damaging leather during life are mange and warbles. The former weakens the leather and the tunnels formed impedes the removal of curing chemicals; and in the latter holes of 2 mm. are formed which in a heavy infection may cause much damage. A heavy louse infection will render the skin useless and ticks will weaken it and produce holes. *Habronema megastoma* lesions render the skin useless.

The usual fault in skinning was found to be through cuts due to clumsiness.

In storage damage may result from frost, iron stain or putrefaction.

Faults in manufacture include bad tanning, grease spotting, bad skinning, lead spotting, lime spotting, etc.

Ways of reducing this damage by regular anti-parasite treatment of animals, skinning at recognized abattoirs, veterinary inspection of skins and storage places and minimum export standards.

—A. G. WARREN.

See also absts. **203** (efficient milking); **210** (cattle sheds); **211** (sea transport of horses); **222** (marking of pigs).

TECHNIQUE AND APPARATUS

—. (1946.) **Report of the committee [of the American Trudeau Society] on evaluation of laboratory procedures. The culturing of specimens suspected of containing tubercle bacilli.** —*Amer. Rev. Tuberc.* **54.** 428–432. **215**

This report recommends certain procedures for the routine cultural examination of suspect tuberculous material. The use of 2–3% NaOH in conjunction with mechanical shaking is said to be the method of choice for the preparation of specimens for culture; the use of certain complex detergent mixtures is deprecated. A simple culture medium containing equal volumes of egg yolk and 8% glycerol-potato water is said to be at least as effective as many of the complex media now in use. This medium is acid; its pH of 6·5 is said to be near the optimum for the growth of human type tubercle bacilli.

—J. LOCHIEL MCGIRR.

WAKSMAN, S. A., & REILLY, H. C. (1945.) **Agar-streak method for assaying antibiotic substances.** —*Industr. Engng. Chem.* Analyt. Edit. **27.** 556–558. [Abst. in *Rev. appl. Mycol.* **25.** 130. (1946), copied *verbatim*.] **216**

Details are given of the agar-streak method for the assay of antibiotic substances, which is considered to offer sufficiently marked advantages over other procedures to justify its wider use, especially in screening tests with a large number of organisms and in the isolation of antibacterial agents from the crude medium. The antibiotic activities of actinomycin, chaetomin, clavacin, fumigacin, gliotoxin, streptomycin, and streptothricin are tabulated. In a study of the inactivation of antibiotic substances by cysteine the test organism was found to exert a decisive influence.

STURA, C. A. (1944.) Técnica para desecar y liofilizar por el congelamiento y el alto vacío. **[Desiccation and lyophilization of various biological products by refrigeration and vacuum techniques.]**—*Bol. tec. Direcc. gen. Ganad., B. Aires.* No. 11. pp. 753–811. [Also appeared in *Gac. vet., B. Aires.* **7.** 11–29. (1945).] **217**

This is a review of lyophilization as a means of storing bacterial cultures, viruses, sera and vaccines. The technique of the process and its effects upon the stored products are discussed. Paralytic rabies virus [South American Rabies, usually transmitted by blood-lapping bats], equine encephalomyelitis virus and foot and mouth disease virus were viable after two years' storage, fowl pox virus after 16 months, swine fever virus after 300 days and ovine contagious icthyma virus after one year. No alteration in the immunological properties after storage was detected. The yield of dry material from a number of various products is given. For example, 500 ml. of bovine serum from an animal infected with foot and mouth disease yielded 75–80 g. dry material and 500 ml. bovine blood gave 180 g.

Lyophilization is considered to be superior to other methods of desiccation.—H. G. ARAMBURU.

BUZANEC, J. (1944.) Procédé rapide pour la recherche des piroplasmes dans le sang des chiens suspects de piroplasmose. **[Rapid method of blood examination for diagnosis of canine babesia infection.**—*Bull. Soc. Path.*

exot. **37.** 145–147. **218**

The method consists of the removal of haemoglobin from the blood films using Ruge's solution :—pure acetic acid 1 g., formalin (40%) 2 g., distilled water 97 g. having previously fixed with alcohol-ether. This is followed by staining in dilute, cold carbol-fuchsine for one minute.

The erythrocytes appear unstained. The erythrocytic envelopes, the nucleated blood cells and piroplasms stain pink.—L. M. Markson.

Wicks, L. F., Carruthers, C., & Richey, M. G. (1946.) **The Piccolyte resins as microscopic mounting media.**—*Stain Tech.* **21.** 121–126. [Authors' abst. copied *verbatim*.] **219**

A new series of synthetic resins, the " Piccolytes " (β-pinene polymers), is recommended for permanent mounting media in histological work. These resins, which are available with various melting points, are of correct refractive indices, very low acid numbers, are pale, non-yellowing, have good adhesion to glass, and are freely soluble in xylene. Of a considerable variety of newer synthetic resins which were tried (stimulated by the recent scarcity of Canada balsam), only these terpene resins were found entirely satisfactory. Being of controlled manufacture, they are uniform in characteristics as well as readily available and very cheap.

A partial review of the literature of synthetic resin mountants is included.

Hegre, E. S., & Brashear, A. D. (1946.) **Block-surface staining.**—*Stain Tech.* **21.** 161–164. [Authors' abst. copied *verbatim*.] **220**

A method is described by which the tissue exposed on sectioning a specimen embedded in paraffin can be visualized in situ. The fixed specimen is impregnated with lead acetate, dehydrated in dioxane, infiltrated with paraffin and embedded. Tissues exposed on sectioning are developed by applying to the cut surface of the block a solution of potassium sulphide in water. Concentrations of the reagents used and the time intervals for the procedure are dependent upon the size of the specimen and upon the degree of contrast required. The method is described as it was applied to the study of a small human fetus in cross section. Representative photographs are included to show the results obtained.

Deschiens, R., Jouan, C., & Lamy, L. (1944.) Nouveau modèle d'étuve à microscope. **[A new model of an incubator fitted with a microscope.]**—*Bull. Soc. Path. exot.* **37.** 258–260. **221**

Dissatisfied with the limitations of the warm stage, these authors have devised a means of combining an incubator with a microscope so as to maintain living preparations at a constant temperature. Essentially the microscope stands in the box, its top part piercing the lid. Light is admitted through the glass panel which forms the front of the box. An inset in the left side provides access to the fine adjustment screw.—L. M. M.

Raschke, O. (1944.) Kopierstifte sind zur Bezifferung der Schweine für die Trichinenschau unbedenklich. **[Copying pencils may be used without hesitation for numbering pigs for trichina infection.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* June 23rd. 205–206. **222**

Water-soluble colouring matters, by-products of tar, which are used in the manufacture of copying pencils might have some irritating effect on the living tissue when applied in concentrated quantities for a long time. The minimal quantity used for the marking of pigs is, however, without any danger.—C. Aharoni.

Ellis, G. H., & Thompson, J. F. (1945.) **Determination of cobalt in biological materials with nitrosocresol.**—*Industr. Engng. Chem.* Anal. Edit. **17.** 254–257. [Abst. in *Dairy Sci. Absts.* **7.** 144. (1945), copied *verbatim*. Signed: J. N. T.] **223**

The test material is treated by wet ignition or ashing at a temperature not greater than 650°C. When the method is applied to milk, the interfering Fe is removed by diethyldithiocarbamate. After oxidation with perchloric acid, a coloured Co complex, soluble in ligroin, is formed upon the addition of sodium o-nitrosocresol in excess. The ligroin extract is examined by colorimeter. The method has given 96 and 100·5 per cent. recoveries of cobalt added to milk. It will measure 0·02 to 25 μg. of Co.

Values obtained for Co in fresh milk were between 0·030 and 0·035 μg. per 50 g. of sample.

Krüger, F. (1942.) Die Möglichkeit der direkten Überträgung von Objekten aus Alkohol in Paraffin. **[Possibility of transferring directly from alcohol to paraffin.]**—*Zool. Anz.* **137.** 226–230. [Abst. in *Stain Technol.* **21.** 78. (1946), copied *verbatim*. Signed: A. B. Dawson.] **224**

The author reports some preliminary attempts to embed tissue in paraffin directly from absolute alcohol. The intermediate steps include the maintenance of a saturated alcoholic atmosphere about the paraffin container together with the addition of absolute alcohol to the melted paraffin. This process of embedding is much slower than the customary methods and the results do not appear to justify the elaborate precautions that must be observed to secure even a moderate degree of success.

MISCELLANEOUS

NORDLUND, I. (1941.) Kannibalism hos höns. **[Cannibalism in fowls.]**—*Skand. VetTidskr.* **31.** 408–416. [Abst. from English summary.] **225**

N. gives a literary synopsis of the incidence of cannibalism in fowls and chickens, describing the manifestations of the disease and its relative frequency in various races and in different seasons. She mentions various theories with regard to aetiology and quotes advice on therapy suggested by various scientists.

Sixty-three of her own cases (mainly White Leghorns) are described. The incidence was highest in March and November. Eighteen of the less serious cases showed small wounds in and around the cloaca with blood infiltration at the edges. Forty-five more serious cases showed also perforating wounds in the cloaca, often quite large, through which parts of the intestine had been pulled out and torn off.

The differences in the findings between cannibalism on the one hand and sadism, unnatural offences on fowls and sarcophagy on the other are emphasized.—F. E. W.

REPORTS

NIGERIA. (1944.) **Annual report on the Agricultural Department for the year 1944.** pp. 47. Lagos: Govt. Printer. Items of veterinary interest pp. 6–21. **226**

ANIMAL HUSBANDRY.—The greatest obstacle to the Department's scheme of mixed farming in which animals are used on small holdings for manure production, is disease. Of 17,590 cattle on the Government and native-owned farms carrying on this scheme, the losses, including unsuitable animals disposed of and theft, etc., amounted to 3,337 cattle. Of these 67·09% are said to have died from disease. The Agricultural Officers estimate that of these 2,236 animals, 30·12% died of trypanosomiasis, 6·83% from contagious pleuropneumonia, 5·09% from liver diseases (liver fluke), 4·91% from rinderpest naturally acquired, 6·74% from rinderpest and other causes after inoculation of susceptible adult and young animals, 8·39% from heartwater, and 5·01% from other diseases.

The scheme is being extended to the pagan tribal areas where immature bulls are being kept for fattening on atcha straw.

The Department is still persisting in its search for a type of cattle resistant to trypanosomiasis. All trypanosomiasis-resistant breeds from tsetse fly areas and cross-breds of these which have been tried out over a great many years have failed to maintain a satisfactory resistance to the disease. CALF SCOUR, which has been a scourge on the Shika Stock Farm for the past 18 years, has been much reduced by the use of fly-proofed buildings in combination with the use of a vaccine prepared at the Veterinary Laboratory. The number of cows with BOVINE CONTAGIOUS ABORTION (4·6%) was higher than in recent years. This included abortions from all causes. All heifers are now inoculated with strain S.19 live vaccine. There were no reactors among the home-bred cows tested on Shika Farm. Among newly purchased cows there were 9·37% reactors. Routine inoculations against RINDERPEST with dried attenuated goat virus of 240 calves was followed, it is said, by a mortality of 6·7%. This included losses from all causes including trypanosomiasis, scour, etc. In a triple inoculation of bovine contageous pleuro-pneumonia culture vaccine of all Shika Stock Farm cattle reactions were slight. Two animals were slaughtered owing to severe sloughing of the inoculated tail. Blood smears from 22 suspected cases of trypanosomiasis showed one had *T. congolense* infection and four *T. vivax*. Later in the year 15–20% of the herd were proved to be infected. The presence of *Glossina tachinoides* was proved along the course of an adjacent river. More rigorous clearing of all timber and shrubs along the courses of adjacent rivers is to be carried out. Losses from piroplasmosis and anaplasmosis have been associated with trypanosomiasis at the Ilorin stock farm where the main experiments are being carried on to test breeds resistant to trypanosomiasis infection.

Helminth infections account for some losses amongst calves at Ilorin.

Blood meal feeding experiments were repeated and showed the value of this concentrate as an adjunct to the ration. It was found particularly valuable for feeding to unthrifty stock.

The production of bacon pigs has developed considerably in Nigeria during the war years. A bacon pig of 180 lb. with a target of 400 pigs a month was the Department's aim.

It has not been found possible, so far, to evolve a scheme of management of goats suitable for the native farmer which would avoid the damage caused to trees and shrubs by their browsing habits and also conserve the manure for the farmer's use on his land. Goats have great importance mainly for the meat they provide and the valuable skins which are an important export product.

Cattle fattening schemes have on the whole

done well, except that an outbreak of bovine contagious pleuro-pneumonia necessitated a new start.—J. A. GRIFFITHS.

TRINIDAD AND TOBAGO. (Undated.) **Survey of animal husbandry, feeding, management and veterinary services in the West Indies. Trinidad and Tobago.** [MILLER, W. C.]—*Development and Welfare, W. Indies.* Bull. No. 19. pp. 40. Bridgetown, Barbados: Advocate Co. 10 cents. **227**

Miller visited these islands from January 14th–18th, 1945. He emphasizes that before livestock production can reach its maximum potential better provision of forage is required, by the cultivation of grasses known to be productive under local conditions. The livestock industry is divided into categories:—cattle maintained for milk or meat production or working purposes; horses, donkeys and mules maintained for working purposes such as riding or haulage animals on estates, or for transport work on the roads, a few horses being kept for breeding and racing; goats, pigs, sheep and rabbits kept to produce human food; poultry kept to produce eggs and meat.

M's observations cover the whole field of animal husbandry and show how much has yet to be accomplished on animal disease and veterinary services. The danger of disease being introduced from the mainland of South America is one which needs constant vigilance in applying the existing quarantine regulations. Animal disease within the colony requires an efficient veterinary service to control outbreaks and to carry out effective preventive measures.

The main diseases of importance are TUBERCULOSIS (bovine and avian), BRUCELLOSIS of cattle, goats and swine, tick-borné diseases—PIROPLASMOSIS and ANAPLASMOSIS, HELMINTH INFESTATIONS in great variety in all animals, SARCOPTIC MANGE in cattle and many other ecto-parasites, bat-transmitted RABIES (paralytic rabies), and EQUINE ENCEPHALOMYELITIS (Venezuela strain).

It is recommended that a staff of a deputy director, a senior veterinary investigation officer, four veterinary officers, five animal husbandry officers with necessary technical and clerical staff should be appointed. Reasons for the various professional appointments are given, particularly the necessity of having animal husbandry and disease control in one department. The salaries and allowances recommended are those in the scales recommended for the unified colonial service. The officers of the veterinary and animal husbandry service envisaged could play an important part in educational developments in co-operation with other departments.

—J. A. GRIFFITHS.

U.S.A. (1944.) **Report of the Secretary of Agriculture, 1944.** pp. 196. Washington, D.C.: U.S. Govt. Printing Office. [8vo] [30 cents.] **228**

This is a general survey of American agriculture in 1944 as affected by the war. The only matters of purely veterinary interest appear towards the close of the report. The report opens with the political and financial aspect, comprising all forms of agriculture, such as labour, housing, soils, crops, forestry.

The production of livestock and poultry products in 1944 were about 40% higher than the average of the five years before the war, from 1934 to 1939. In experiments affecting dairying it was found that the oxidation of lecithin, a constituent of the membrane surrounding the fat globules of milk, is the main reason why the dried whole milk becomes stale so rapidly in storage. Experiments are also recorded showing an improvement in the keeping qualities of eggs.

In 1943 enough serum was manufactured for the inoculation of 70,000,000 pigs against swine fever. With sheep it was found that those with plain faces raised more and heavier lambs than those with faces covered by the wool. The addition of phosphorus to the diet increased the calving rate in cattle by nearly one-third.

The Department maintained its usual quarantine and inspection so as to prevent the introduction of contagious disease. This was successful. An outbreak of contagious vesicular disease in pigs found to be vesicular stomatitis which closely resembles foot and mouth disease, was successfully suppressed.

A slight increase in the percentage of reactors to the tuberculin test was recorded, 0·02% in 1944 against 0·18% in 1943. Vaccination with strain 19 was of great assistance in the eradication of brucellosis or Bang's disease. Warble fly infections were treated in cattle by derris in washings, sprays or as the dry powder. Nearly 4,500,000 lb. of phenothiazine were used for parasitic diseases. A large-scale treatment of liver fluke disease by carbon tetra chloride was carried out.—D. S. RABAGLIATI.

ANON. (1947.) **Control of rabies. Report by the committee on public health relations of the New York Academy of Medicine.**—*Publ. Hlth Rep., Wash.* **62.** 1215–1237. **229**

The measures adopted for the control of rabies in the various States of America are reviewed and briefly summarized in an appendix. Advances in knowledge of the virus and of vaccines since 1942 are also reviewed. As a result of this study eleven recommendations are made for the control of rabies. These deal with the need for uniformity in control measures, interstate movement of dogs,

importation from foreign countries, compulsory reporting of the disease in man and animals and annual licensing and annual vaccination of dogs. Vaccination is especially urged in urban areas. One injection of 5 ml. of an approved vaccine is considered to be effective for mass immunization but three injections at weekly intervals give a higher immunity and should be used when practicable.—M. C.

SWEDEN. (1944.) Sveriges Officiella Statistik. Hälso- och Sjukvård. Veterinärvård vid Armén är 1943 av Överfältveterinären. **[Sweden: Report of the Army Veterinary Service for 1943.]** [A. Morén.] pp. 30. Stockholm: Kungl. Boktryckeriet P.A. Norstedt & Söner. **230**

The veterinary qualified personnel in the Swedish army consisted in 1943 of one chief veterinary staff officer, seven veterinary staff officers, seven regimental V.O.s and 15 battalion V.O.s.

The report consists of extracts from the reports of the above officers, with statistical data in tabular form. The overall sickness rate among the army horses was 9·6%. The causes of sickness was conventional. Strangles was rather prevalent and caused a large outbreak in one remount depot. Among the reports on particular cases, reference is made to a case of generalized eczema with hair loss in a horse which recovered spectacularly after the use of a *Bact. coli* vaccine. One horse affected with filariasis died suddenly at exercise and was found to have suffered from chronic myocarditis.

Reference is made by many veterinarians to the lack of proper veterinary hospital facilities and of skilled farriers, at the various regimental depots.

Notes are also given on diseases in army dogs. —J. E.

SWEDEN. (1946.) Sveriges Officiella Statistik. Hälso-och Sjukvård. Veterinärvård vid Armén år 1944. **[Sweden: Report of the Army Veterinary Service, 1944.]** pp. 26. Stockholm: P. A. Norstedt & Söner. **231**

The veterinary officer strength with the Swedish army comprised in 1944, one chief V.O., seven regimental V.O.s and 15 battalion V.O.s.

The report consists of numerous statistical tables, showing the incidence of diseases in the army's horses and dogs, and also of many disjointed reports from the various veterinary officers, mostly about casual accidents and diseases, of no epizootiological interest. The total horse and dog strength is not given.—J. E.

U.S.S.R. (1940.) Voprosy sanitarii i zoogigieny na plenume vetsektsii Vaskhnil. **[Sanitary and animal hygiene. Review of the proceedings of the plenary session of the Veterinary Section of the Academy of Agricultural Sciences 21st-25th February, 1940.]**—*Veterinariya, Moscow.* No. 3. pp. 125–127. **232**

In his review of the proceedings of the veterinary section of the Academy of Agricultural Sciences the author summarizes papers read by members taking part in the proceedings including scientists of research institutions and technical high schools and universities and veterinary surgeons attached to industrial laboratories, ministries and agricultural organizations. The papers cover aspects of sanitation and animal hygiene; meat production and meat and fish examination; food contamination and toxins; disinfection of raw hides, wool and manure. Twenty-two separate papers were presented on problems of hygiene divided into three main groups, buildings, feeding and watering, and animal care. Methods of teaching at the veterinary high schools and their curricula formed an important part of the discussion.—E. CHERKESI.

SCHULTE. (1944.) Bericht über die Tätigkeit des bakteriologischen Laboratoriums des Schlachthofes I, Essen im Jahre 1943. **[Report of the bacteriological laboratory of slaughterhouse I, Essen, 1943.]**—*Z. Fleisch- u. Milchhyg.* **54.** 206–208. **233**

In the report of the bacteriological laboratory of the Essen slaughterhouse for 1943 S. gives statistical analysis of bacteriological meat examination and examination of separate organs, testing by boiling and roasting, examination of foodstuffs, also sectional and microscopic examination. The total number of bacteriological meat examinations revealed a decrease of 35% compared with 1942, whilst slaughtering for commercial purposes decreased by 18% and compulsory slaughtering from all causes by 44% during the same year. A table summarizes results of bacteriological meat examinations and shows that *S. enteritidis* was present in five cases. Over 500 kg. of cooked meats contaminated through delayed delivery by post or rail were sent to the laboratory for examination in order to recover the expended meat coupons.—E. CHERKESI.

BOOK REVIEWS

FRANCIS, J. [B.Sc., M.R.C.V.S.]. (1947.) **Bovine tuberculosis: including a contrast with human tuberculosis.** pp. 220. Numerous figs., tables and references. London: Staple Press Ltd. 25s. **234**

In this book the author has endeavoured to bring together all the important information on "incidence, the development of the disease in the

animal body, the mechanism of spread from one animal to another and the methods of control most likely to be successful, particularly in Great Britain". He has succeeded very largely in his efforts and is to be congratulated on the result.

The book is a mine of information and will become a standard reference book on statistical aspects of the bovine tuberculosis problem.

If one may venture a criticism on such an excellent book it is to question the wisdom of the title. The title "Bovine Tuberculosis" is a very wide one and suggests that the reader will find, *e.g.*, detailed information regarding the bovine type of tubercle bacillus and its differentiation and how it produces its effects with particular reference to the phenomenon of caseation and calcification. The histo-pathology of the lesions too receives little attention and in dealing with the tuberculin test one might have expected to find some discussion of the histopathology of the reaction and the underlying phenomenon.

Veterinary practitioners who are called on under the Tuberculosis Order to decide whether a reported case is really one of tuberculosis or not will receive little help. The symptomatology of tuberculosis is not dealt with, beyond stressing that "The thick thoracic wall and great bulk of the organs obviously makes clinical detection of tuberculosis more difficult in the bovine than in man". "Unless enlarged lymph-nodes can be palpated it is obvious that detection of the tuberculous cow by clinical methods is difficult and often impossible", as 40–50%, at least, of the type of cow reported will react to the tuberculin test, and as quite a small lesion of tuberculosis will sensitize an animal to the tuberculin test the tuberculin test is not considered by officialdom as being the answer to this problem.

In comparing the bovine type of disease with the human the reason for the comparative frequency of haemoptysis in the human and its absence in the bovine is not discussed.

These criticisms are directed towards the title and must not be allowed to detract from the value of this book. The author has assembled in a very readable form a vast amount of information on such subjects as "The Incidence of Tuberculosis". The historical aspect is well covered and the extent of the disease in various countries is reviewed.

The "Effect of Heredity and Environment on the Incidence of Tuberculosis" is ably discussed, and is followed up by a section dealing with the economic aspects of the disease. Under the heading "Pathogenesis" the author discusses methods of infection and deals briefly with the development of the disease in the human being.

The primary focus of infection is referred to and it is emphasized that this primary lesion in the bovine rarely heals and the lesion remains open in contradistinction to what happens in man. [Incidentally it must often be a matter of great difficulty to determine the seat of the primary lesion in the bovine]. The inference is that a bovine once infected is infective to its fellows for the remainder of its life—a point of great importance in the establishing of tuberculin tested herds.

The author does well to focus attention on calfhood infection and the high incidence of uterine infection may surprise many people. The evidence brought forward by the author in this section strongly supports the view that tuberculosis is in the main a house infection.

The section on tuberculosis of the udder is well conceived and the author has assembled his evidence in a workmanlike manner. Incidentally he has found room to refer to the dangers from careless use of instruments not efficiently sterilized, a point worth emphasizing.

Most veterinary scientists are aware of the risk of cattle becoming sensitized to tuberculosis by exposure to avian infection, but it is probably not sufficiently realized that reactors will almost certainly develop in a herd if the attendant has active pulmonary tuberculosis, a point which should be born in mind when reactors are found in an attested herd.

The author brings this point out in a striking manner and incidentally refers to Glover's work that a dual infection with both avian and bovine types can be present. In dealing with the comparative tuberculin test this point should never be overlooked. The evidence presented by the author supports the system of meat inspection adopted in Gt. Britain and it is hoped that his remarks on centralization and modern abattoirs will bear fruit.

One read with very great interest the section on "Tuberculosis of Bovine Origin in Man" and in the present state of our milk supplies no one can dispute the author's contention in favour of efficient pasteurization.

There is a short but useful review of the literature on tuberculin testing and the author's conclusion "That there is very little difference in the reliability of the subcutaneous or intradermal tuberculin tests" should be noted. That the subcutaneous test is usually negative in animals with skin lesions is surely a point in favour of this test.

The published work on vaccination against tuberculosis is summarized but one regrets that the author has not had access to the reports which must be in the possession of the Agricultural Research Council on the recent BCG vaccination

experiments conducted under the auspices of that body. The final chapter as one might expect deals with control. Few will question the conclusions regarding the failure of the Bovine Tuberculosis Order as a means of reducing the incidence of bovine tuberculosis and the author presents the case in favour of area eradication in a very convincing manner. The growth of the Attested Herds Scheme seems to indicate that there is a strong desire in parts of Gt. Britain for area eradication.

The summary at the end of each chapter is an excellent arrangement and the final summary and conclusion is quite an achievement.

All the way through the book the emphasis is on the statistical aspect of tuberculosis and one wonders if the title of the book could not with advantage be altered to indicate this.

The work is well produced and is very free from serious errors. Incidentally is the A.R.C. laboratory at Weybridge ? The price, 25s., compares unfavourably with that of Rich's book on "The Pathogenesis of Tuberculosis".

(There is still room in veterinary literature for a book on the same lines as Rich's.)

Francis' book can be recommended with confidence to all interested in the problem of tuberculosis, both human and animal. In particular it should prove of great value to Public Health Authorities.—H. G. LAMONT.

WRIGHT, J. G. [M.V.Sc., F.R.C.V.S., Professor of Veterinary Surgery, University of Liverpool]. (1947.) **Veterinary anaesthesia.** pp. viii+218. 62 figs. London: Baillière, Tindall & Cox. 2nd Edit. 8vo. 12s. 6d. **235**

This is obviously a carefully planned book, comprehensive in scope and clearly written. Not only are methods of anaesthesia in various animals discussed but so are also the pharmacological properties of the main drugs used and in the discussion of inhalation anaesthesia, the author refers the reader to A. J. Clark's book for further details. Local, spinal, inhalation, intravenous and rectal anaesthesia are described and it is clear that in veterinary, as in human anaesthesia, there has been much recent progress. The author mentions *Cannabis indica* amongst the drugs used for narcosis, and some results he has obtained with these drugs on the horse. It seems regrettable that this drug has fallen into disuse although the difficulties of standardization have not yet been overcome. Synthetic analogues may ultimately provide a satisfactory alternative. Perhaps it is rather early to expect any data on the possible usefulness of curare preparations which have provided so important an advance in human anaesthesia, but it is surprising that no reference is made to numal, which can be very useful in some of the smaller animals.—J. M. ROBSON.

BLOUNT, W. P. [Ph.D. (Edin.), F.R.C.V.S., F.R.S.E., Major, R.A.V.C (T.A.). Formerly Chief Veterinary Officer, E. Sussex C.C.]. (1947.) **Diseases of poultry. With specialist chapters on poultry husbandry.** pp. xv+562. Numerous figs. and refs. London: Baillière, Tindall & Cox. 21s. **236**

The book deals with disease, breeds, management, incubation, physiology, nutrition and husbandry in general. In compiling the text the author has had the assistance of a number of colleagues and others who have had wide experience of the various aspects of the poultry industry.

The book is divided into six parts. Part 1 deals concisely with what is called field work and embraces such aspects as housing and management, feeding, pedigree breeding, recording and, somewhat surprisingly in this section, structure and physiological development of the embryo. Part 2 deals mainly with avian physiology. Part 3 discusses embryonic mortality and disease losses at laying trials. A short discourse on the development and common diseases of the pigeon is included and common conditions seen in birds in zoological collections are briefly noted. Part 4 deals with systemic diseases. The main disorders of the various systems of the bird are discussed in a general way. There is an interesting chapter on the blood picture in health and disease. A chapter in this section deals with pharmacology and toxicology and one on poultry meat inspection. Specific diseases (including parasitology) are described in Part 5 and in Part 6 there are brief but interesting accounts of the poultry disease position in various parts of the world.

The book attempts to cover a very wide field and the author has amassed a great deal of information on the various aspects and problems of the poultry industry. Inevitably in a work of this scope there are gaps. Fowl Plague and Newcastle Disease are disposed of in three pages. One can only surmise that this section was completed before Newcastle Disease made its recent catastrophic onslaught on the poultry population of England. [In the United Kingdom Newcastle Disease is dealt with administratively under the Fowl Pest order; this note is inserted because persons in other countries may be under the impression that the present epidemic is fowl plague. The name "fowl pest" is now often used in the United Kingdom when the desease referred to is Newcastle Disease.]

The shortcomings of the tuberculin test are glossed over very superficially. In the differential diagnosis of Bacillary White Diarrhoea the ability of *S. thompson* infection to produce lung nodules is not mentioned. The persistence of

S. pullorum infection in contaminated ground is not considered and one would have liked a fuller discussion on some of the anomalies in blood testing of poultry for the control of bacillary white diarrhoea. Retesting of in-contact flocks is recommended within 3–5 weeks but many workers will doubt the value of testing at such short intervals. The possible part played by wild birds in the propagation of bacillary white diarrhoea infection is not mentioned. A fuller consideration of salmonella organisms (other than *S. pullorum* and *S. gallinarum*) would have been welcome.

These criticisms are largely of degree only and while some may question the wisdom of attempting to cover such a wide field in one volume there is no doubt that the author has achieved much in this book and all connected with the poultry industry will find it very useful. The book is well produced on good quality paper. There are numerous photographs illustrating the text though some of these could have been omitted without detracting from the value of the work as a whole.—D. LUKE.

MAYNARD, L. A. [A.B., Ph.D., Sc.D.; Professor of Nutrition and Biochemistry and Director of the School of Nutrition, Cornell University; Member, National Academy of Sciences]. (1947.) **Animal nutrition.** pp. xviii+494. 44 figs., 34 tables, numerous refs. New York: McGraw-Hill Book Co., Inc. 2nd Edit. 8vo. $5.00. **237**

The first edition of this book appeared in 1937, and over the ensuing nine years advances in nutritional science, including those of the war period, have been so rapid that the author has had to make considerable additions, revisions and deletions of much of the original material. The general plan and lay-out of the work remain essentially the same. Written primarily for the author's own students the book is no doubt an amplification of the regular course given at Cornell University in animal nutrition, and the author's hope is that other teaching centres may find the work useful. The treatment of the subject is fundamentally academic. The practical consideration of feeding stuffs and rationing are kept very much in the background and the inclusion of chapters on growth, reproduction, lactation and work production, though very readable and interesting, written as they are from the physiological aspect, serve to emphasize the essentially academic treatment of the subject.

The student is assumed to have a basic knowledge of organic chemistry and physiology, and after chapters devoted to the carbohydrates, proteins, lipoids and minerals, the work passes on to the vitamins, conceptions of digestibility, nutritional balances, energy, fasting, catabolism and maintenance, and thence on to growth, reproduction, lactation and work production. The starch equivalent system of practical rationing with which British readers are more familiar is discussed in less than a page. There are numerous references to original literature, but of these American references are deliberately predominant. According to the preface, "in listing papers as reference reading their availability in the libraries throughout the country is an important consideration." The paucity of references to the work of certain British nutrition authorities is surprising.

The work is well written, in a very readable style and the average reader will find many sections of interest and profitable study. The reviewer feels, however, that the book, in spite of its many good points, is rather too circumscribed in outlook to make it universally applicable to students throughout the world and for the agricultural and veterinary student the treatment of the subject is insufficiently practical to be of the fullest value in preparing him for his future career. As an introduction to the principles of nutrition the book has much to recommend it, but as a comprehensive treatise on animal nutrition, has very definite limitations to its usefulness for the student whose subsequent career involves the practical application of his knowledge.—A. EDEN.

ANDERSON, C. G. [Ph.D. (Birm.), Dip. Bact. (Lond.), formerly Lewis Cameron Teaching Fellow, Bacteriology Department, University of Edinburgh]. (1946.) **An introduction to bacteriological chemistry.** pp. x+500. 12 figs., 34 tables, 2 appendices. Numerous refs. Edinburgh: E. & S. Livingstone, Ltd. 2nd Edit. 8vo. 20s. **238**

In the first edition of this work in 1938 the author attempted to provide an introduction to bacteriological chemistry for students taking degree and diploma courses in bacteriology, with the principal aim of giving a survey of the whole field as it then appeared. Only certain aspects of immunochemistry were considered, and no attempt was made to cover the subjects of disinfection and chemotherapy, as it was then felt that although a great deal of empirical data was available, the exact knowledge of the mechanisms involved was too fragmentary to warrant inclusion. Nevertheless, the work had a very friendly reception, and numerous students and research workers have profited by the results of Anderson's labours.

Since 1938 the natural tendency for all fields of science to expand has been accompanied by unprecedented developments in bacteriological chemistry, stimulated by the demands and abnormal conditions of a major world war. During this time tremendous advances have been made

in our knowledge of chemotherapy and the antibiotics, to mention only two directions. The need for revision has been met by a new edition, which while still adhering to the general plan of its predecessor, has been brought up to date by the incorporation of new material in a number of chapters, by the introduction of a chapter on antibiotics, and by a fresh presentation of the latest knowledge on growth factors.

The book is divided into three sections plus two useful appendices. The first part is general and deals with such considerations as pH, colloids, enzymes and the chemical composition of microbiological organisms; the third with some aspects of immuno-chemistry. The greater part of the work, comprising 16 chapters in all, deals with the metabolism of micro-organisms including chapters on chemotherapy, antibiotics and growth factors. A knowledge of a certain amount of bacteriology and organic chemistry is assumed on the reader's part, and such is the present trend of the subject that its development appears to be increasingly along the lines of organic chemistry.

Besides a nice selection of the material presented the author possesses the art of carrying his reader along with him through a clear and logical exposition of the subject. The work throughout is very readable with a conspicuous clarity of presentation. The general welcome accorded to the first edition should be equally extended to its successor, and the book should be read by all whose interests lie predominantly in the fields of both bacteriology and bacteriological chemistry.

The printing, binding and quality of paper are all of a good standard.—A. EDEN.

LAFENÊTRE, H. [Docteur Vétérinaire. Ancien Chef des travaux d'Anatomie pathologique et d'Inspection des Viandes à l'École Nationale Vétérinaire de Toulouse. Directeur des Services Vétérinaires de l'Hérault], & DEDIEU, P. [Docteur Vétérinaire. Chef du Service d'Inspection des Comestibles et Directeur des Abattoirs de la Ville de Montpellier. (1946.) Technique Systématique de l'Inspection des Viandes de Boucherie. [**Systematic technique of the inspection of butchers' meat.**] pp. 450. Numerous figs. and refs. Paris: Vigot Frères. 2nd Edit. **239**

Judging from the detailed information contained in this work, a second edition bringing the subject up to date was well worth the author's while.

The instruments, equipment, apparatus, the methods and system, and personnel required by a meat inspector in an abattoir laboratory, are described.

Emphasis is laid on *ante-mortem* examination of the animals before slaughter. In the case of all animals three inspections are mentioned, an inspection of the viscera, thoracic and abdominal along with their appendages; the examination of the carcass; and the third, with the offal other than the thoraco-visceral organs such as the head, the feet and the skin.

The third chapter describes all the laboratory methods in use, including the preparation of specimens, the staining of films and sections, the cutting of sections and the aids to the diagnosis of the various conditions encountered.

The systematic inspection of cattle, the special inspection of cattle with regard to the presence of contagious disease and parasitic conditions, the inspection of the calf, the pig and the horse are described. It is more important to examine horses than other animals before slaughter, as certain diseases are more difficult to diagnose after slaughter than before. These are tetanus, anasarca, glanders and farcy.

The book then deals with the inspection of foreign carcasses, chilled and frozen meat, diseased meat and carcasses seized, and finally ends with a chapter on the administration and office aspect of meat inspection. If one may criticize the arrangement of the work there would appear to be some duplication and repetition which might be avoided, but, despite these points, the authors have produced a clear, readable and most practical work on the subject. The illustrations and plates are excellent and show exactly how the various glands can be found and examined and the work is one which should be in the hands of every meat inspector.—D. S. RABAGLIATI.

CAZAL, P. [Chef de Clinique à la Faculté de Médecine de Toulouse]. (1946.) La réticulose histiomonocytaire. [**Histomonocytic reticulosis.**] pp. 195. 32 figs, numerous refs. Paris: Masson & Cie. Fr. 350. **240**

The history, lesions, changes in the blood picture and clinical diagnosis are dealt with in four sections. This disease of man is defined as being characterized by metaplastic and systemic proliferation of reticulum cells and histiocytes, which may remain localized, or may pass into the blood as more or less typical monocytes. The relationship of the disease to such conditions as the leucaemias, erythroblastosis, agranulocytosis and neoplastic disease of the reticulo-endothelial system is discussed in detail.—M. C.

See also abst. **20** (tularaemia).

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